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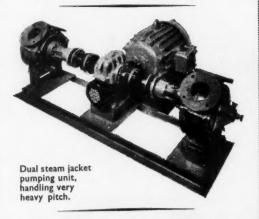
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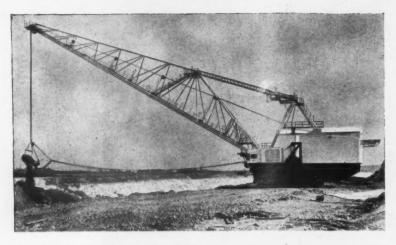


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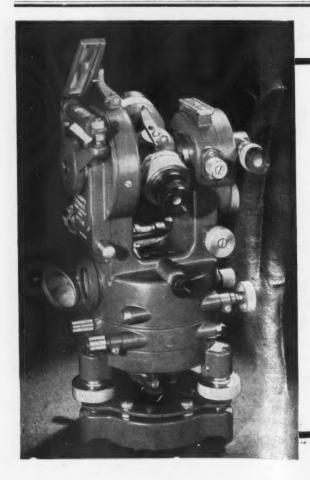
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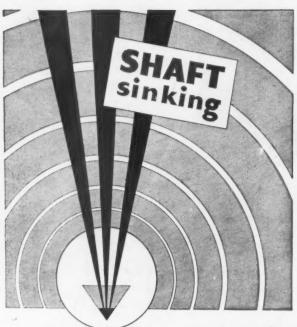
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NOTES AND COMMENTS

Reflections On The Tin Agreement

With the signing of the International Tin Agreement this week by Indonesia ratification of the Agreement by producer countries is assured, and if, as seems probable but not yet certain, Thailand also signs the Agreement, there will be a 100 per cent producers vote in favour of the scheme.

The outlook for ratification by consumer countries, who have only until next Wednesday to declare themselves, still remains uncertain, although prospects were considerably improved with the announcement this week that France has decided to sign, bringing the total number of consumer votes so far recorded in favour to 311. For consumer ratification to become effective a further 22 votes are required and at least another three countries must sign. It has been widely rumoured that the support of Australia, Italy and Denmark is assured, but these countries have apparently taken no definite action yet, and other countries such as Western Germany and Switzerland have expressed their intention of sitting on the fence and will presumably join the Agreement only if ratification is assured.

There is, of course, no gainsaying the fact that the proposed Tin Agreement is essentially a producers' agreement, with the important difference from the pre-War scheme that the active collaboration of consumer interests is being sought. Even so, it is not difficult to understand the hesitation about coming into the scheme which consumer countries are exhibiting. In the absence of a political disaster in South East Asia of such a magnitude as to cut off the bulk of the tin supplies from that area (an event which in any case would probably render the Agreement unworkable), many consumers must feel that the normal working of supply and demand would assure them of a lower tin price than they are likely to get under the Agreement. It seems therefore, that the considerations which are the most likely to produce the necessary consumer support will be political rather than economic, and that if the Agreement does go through it will mean that enough consumers feel it worth while to support the tin price in order to sustain the economy of those tin producing countries which are especially menaced by Communism.

The more cynical may feel that ratification by consumer interests is in a sense of minor importance as, if the proposed Agreement fails to go through, there is nothing to prevent it being put into operation, with a suitably revised constitution, as a purely producers' agreement. However, if this regrettable position were to be reached it could be that the floor and ceiling prices written into a revised agreement might be less attractive to consumers than the present ones, although here the last word would probably rest with the States which would doubtless not hesitate to sell from the stockpile if there were any suggestion of "gauging."

Assuming that the necessary consumer support is forthcoming for the Agreement, much work remains to be done by the Interim Committee before the machinery of the Agreement can be set in motion. Under the articles of the Agreement, important decisions by the Council will be taken by majority votes of producer and consumer countries separately; thus each group will in effect have the power of veto. Under these circumstances the appointment to the chairmanship of the Council may well prove to be of critical importance. It seems inevitable that some entirely neutral person must be appointed to this post and it may well be that someone entirely outside the industry will be called upon. Given the right man it would seem desirable that responsibility for major buffer stock policy decisions in between Council meetings should rest with the chairman rather than that the buffer stock manager should again be placed in the somewhat invidious position in which this official frequently found himself under the pre-War agree-

In the last analysis the success of the Agreement seems destined to depend on the good sense of the Council members and perhaps on the judicious use they make of the provisions in the articles for amending the Agreement in the light of experience.

One fortunate development, which could scarcely have been foreseen last December, is the U.S. Administration's continued operation of the Texas smelter for a further year, which promises to syphon off surplus tin production into the U.S. stockpile, long enough to ensure that there will be no serious pressure of surplus tin on the market this year. Consequently the Interim Committee has, at any rate, six

months in which to ensure that the foundation of the new organization are surely laid.

The Cyprus Mining Industry in 1953

It is not generally understood perhaps how far and to what extent the island of Cyprus depends for its revenue on its mining industry. It was therefore pertinent for Mr. F. T. Ingham, Acting Inspector of Mines, to stress in his Annual Report for the year 1953 that the value of minerals exported last year amounted to 50 per cent of the total value of all exports from Cyprus. Although direct revenue from these exports may be delatively small, indirect revenue—more particularly in the form of income tax, is considerable. Nevertheless it is reported that money expended in the colony by mining companies, excluding income tax paid, exceeded £5,000,000; while the employment of over 6,600 in the mining industry reveals the area of prosperity over which the fortunes of the industry has a marked influence.

The peak production attained in 1952 when the value of the minerals exported reached £10,264,000 was not equalled last year, but the total value of the minerals exported was still impressive at £7,783,575—a figure which has only been surpassed in the years 1951 and 1952. The decline in value was not due to any apparent lack of demand for the minerals produced but was attributed to the lower prices prevailing for pyrites and copper. Mr. Ingham, however, views the current outlook favourably and states that no marked reduction of the exports of mineral products, provided the present cost—revenue ratio is maintained, can be expected in the immediate future despite the fact that the known reserves are very limited.

The importance of exploration and development to the continued prosperity of Cyprus is obvious and Mr. Ingham was able to report that there was strong activity in prospecting mainly by exploratory drilling. Some promising results were obtained although no high-grade orebody of any significant size was proved.

Cyprus Mines Corporation, the island's largest mineral producer mined approximately 681,652 tons of cupreous pyrites at its Mavrovouni Mine, a decrease of some 63,000 tons on that achieved in the preceding year. The ore was railed to the company's concentrating plant at Xeros which has a total capacity of 60,000 tons per month. The output included 73,181 tons of copper concentrates averaging 21.16 per cent Cu, 422,970 tons of flotation pyrites (49.9 per sent S), and 1,883 tons of copper cement (77 per cent Cu).

The Hellenic Mining Co. which operates a pyrites mine at Kalavasis carried out an appreciable amount of exploratory drilling. This indicated strong pyrites mineralization in the Alestos area, and an ore deposit carrying low copper and silver values near Asproyia. But in both instances further work will be necessary before the significance of the deposits can be assessed.

The Esperanza Copper and Sulphur Co. and its whollyowned subsidiary, the Cyprus Sulphur and Copper Co., continued to make good progress. The Cyprus Asbestos Mines Ltd. quarried and produced less asbestos than in 1952 and the same situation arose with the Cyprus Chrome Co., whose output of chrome from their mine in the Troodos Mountains contracted owing to a perceptible shortage of stope faces being available in the early part of the year.

The mining industry was again free from any major interruption of operations through labour disputes, the only disturbance during the year being at Kambia where a few men went on strike as the result of the activities of agitative Broadly speaking, labour seeking employment at the rules was plentiful, although after the Paphos earthquakes there was a marked shortage of masons for constructional well.

The Rhodesias

(From Our Own Correspondent)

Salisbury, June 19.

The suggestion that a marketing board for base minerals should be set up in Southern Rhodesia has been made by the chairman of the Rhodesian Smallworkers' and Tributors' Association. He told a meeting of the Association that the establishment of such an organization would do much to alleviate the difficulties at present facing base mineral producers. Another suggestion made at the meeting was that the Government should introduce a metals market, as mining, although a basic industry in the Colony, was constantly losing members from its ranks.

The much-publicized railway strike in Rhodesia fortunately came to an end before a great deal of direct harm was done. It is true that because of the strike the Copperbelt was denied deliveries of coal, but apart from Mufulira, where oil-burning equipment was brought into use, there were no actual stoppages of production. What is brought home to the inhabitants of the Federation at such times of national stress is how vulnerable Central Africa becomes, when, at the whim of a few agitators, it is possible to threaten a serious dislocation of industry and virtually bring the Federation to a standstill. It is at such times, also, that it is realized how imperative it is to proceed as quickly as possible with the hydro-electric power schemes at Kariba and Kafue.

SOCIAL AND RESEARCH AMENITIES ON THE COPPERBELT

Mr. Harry Oppenheimer, M.P., deputy chairman of Anglo American, opened the new £300,000 research centre of the Research and Development Division of Rho-Anglo Mine Services in Kitwe this week. The centre, comprising research laboratories and a pilot plant, is the only one of its size in the Federation, and is the biggest in British Africa. It will be used mainly for metallurgical research into vanadium, cobalt, copper, zinc and lead.

A long-service, non-contributory pension scheme for African mine employees on the Copperbelt is due to begin on July 1. Announcing this earlier in the month, the Northern Rhodesia Chamber of Mines stated that the pensions will vary from £48 to £72 a year. The coppermining companies will also introduce a leave scheme which provides for 14 days' annual leave, which may be accumulated up to 56 days.

Kamativi Tin Mines Ltd. announced this month that it intends eventually to operate on a scale five times as great as at present, and if it did so it would "produce very substantial revenue for Southern Rhodesia." Mr. J. Bierling, managing director of the company, said a pilot plant would come into production about August. The plant had a capacity for treating 50 tons of ore per hour—1,200 tons per day. By the time the plant came into action, £700,000 would have been spent by the company on development.

The Rhodesian agent for Messina (Transvaal) Development Co. Ltd. gave some details this month about his company's activities in the Eastern Districts of Southern Rhodesia, where it has taken an option on the 50 years' old Mkondo (copper) mine, in the Sabi Valley. The agent told an interviewer that nearly £100,000 was being spent in the initial development of the mine. The activities covered three or four sq. miles of the 100 sq. mile prospecting reserve and they had been proceeding quietly for the last three years. There was a possibility that Mkondo would be in full operation before the end of this year.

Columbite in Nigeria

By W. E. SINCLAIR, M.I.M.M.

For 50 years Nigeria has been known mainly as a tin producer having an average of approximately 5 per cent of the world's output, although in recent years this record has been overshadowed by the substantial recovery of columbite as a by-product mineral, and the field now produces a maximum of 95 per cent of world columbite output. Although certain of the facts contained in this article have already appeared in The Mining Journal Annual Review, 1954, it is felt that the whole will be invaluable to readers as a work of reference.

Columbite, to-day a more valuable by-product than tin itself, serves as a much needed stabilizing medium in the uncertain economy of tin mining on the Bauchi Plateau. This has suffered many vicissitudes as a direct result of the obstinate and enduring price fluctuations of the metal down the years, plus, in this field, the handicap of costly exploitation of the erratic and irregular structure and variable values of the deposits. In addition, the unreliability of water supplies for essential alluvial workings has added to the other difficulties, which have became accentuated as work has opened up deeper and more scattered areas made up of harder ground and poorer values

GEOLOGICAL STRUCTURE

A sequence of granite intrusions and a succession of erosions at transient periods and then the final elevation of the granite batholith, which caused redeposition of certain areas, were together responsible for three distinct types of deposits. These mineralized gravel bodies assume one or other of the following forms: Detrital, alluvial, terraced or Fluvio-Volcanic, each differing radically as to depth, extent laterally and class of overburden. Mineralization in each case is confined to a layer of gravel or "wash" resting on the decomposed granite bedrock, or "fileli" which is the Hausa term for it. This has resulted from the granites or pegmatite dykes and in some areas enrichment is apparent as a result of secondary deposition.

EXTRACTION METHODS

In general, exploitation follows principles common to most alluvial fields. The shallow detrital and alluvial areas were originally worked by hand and simple sluicing methods. Excavating machinery was first introduced about 1925 to work the deeper ground.* Mechanical shovels, walking draglines and other excavating and transporting plant has since followed to strip deep overburden and to handle the gravel, operations that are normally supplementary to gravel pumps used for delivering the "wash" to sluice boxes or cleaning plants. Where water is available in sufficient quantity hydraulicking and other forms of alluvial equipment provide a necessary means of operation.

Because of the seasonal rains and the lack of flowing rivers on the Plateau, 4,000 ft. above sea level, a regular and continuous water supply for alluvial work is maintained by storage dams into which the water is returned and reused during the dry season.

With a view to overcoming some of the difficulties outlined above, several mines are testing underground methods of mining in the deep lead deposits. Earlier efforts in this direction, were known as "loto" work and consisting of a simple pillar and stall system which, although effective in obtaining a comparatively cheap and quick return, gave poor extraction results because of the loss of tin left behind in the pillars. If this could be obviated by a method of "retreating-shrinkage" and a substantial skim of the decomposed bedrock picked up, the results would probably

be more effective and more economical than having to excavate and move large tonnages of overburden, especially where drilling and blasting is necessary to shatter the ground before excavation.

In recent years most mines have been in a position to obtain all their power requirements from the Nigerian Electricity Corporation who now provide up to sixty million units annually to the mines. Their expanded hydroelectric plant is now capable of satisfying all present demands.

Prospecting and exploratory drilling play an important part in all areas and expanded programmes have been a general rule since columbite came into the picture. Apart from the usual aim of determining extent and tenor of the gravel beds, the delimitation of the columbite bearing gravels has been a factor of major importance, since this mineral is unevenly distributed with the tin. Hence, some mines produce little or no columbite at all. The following are the main tin producers.

PRINCIPAL PRODUCING MINES

Mean Monthly Output of Tin Concentrates (tons)

Tracuit Tractition,	Cuipui of Im Col	iceminics (ions)
200 - 400	10 - 30	-10
Amalgamated Tin	Jantar Nigeria†	Ribon Valley
Group*	Jos Tin	Rukuba
30 - 60	Kaduna Syndicate	Kaduna Prospectors
Bisichi†	Keffi Tin	South Bukuru
Ex-Lands Nigeria	London Tin	Tin Fields of Nigeria
Gold and Base Metal	Naraguta Tin‡	United Tin Areast
Mines of Nigeria‡	Naraguta Ext.	Filani
	Naraguta Karama	

Columbite producers: * up to 30 tons monthly; † 10 to 20 tons monthly; ‡ up to 10 tons monthly.

Most of these mines have been established tin producers for some years. Columbite production from those shown has been rather irregular as a result of an uncertain recovery from the treatment of old dumps. However, as these reserves dwindle columbite output depends essentially on primary recovery from mining gravel reserves. The mineral content in these is extremely variable ranging from trace up to as much as 50 per cent in exceptional cases.

NIGERIAN COLUMBITE

Advanced industrial development has claimed columbite $(F_e Mn)$ (CbTa)₂O₄, when employed as ferro-columbium (60 per cent Cb), as a valuable alloy in chrome and chromenickel steels. In these alloys the columbium fraction restrains the loss of corrosion resistance due to intergranular precipitation of carbides upon continuous exposures to high temperatures.

Originally applied to minor uses it has now become of vital importance in the construction of gas turbines in jet aircraft engines and in other special steels that require a stabilizing element to withstand corrosion and collapse at high temperatures.

Although the term columbite is almost a household word to-day and much has been written about the mineral in recent years, some confusion is still prevalent when reference is made to its association with tantalum, niobium and pyrochlore. As a matter of interest columbium and niobium are essentially the same. Columbite, as the common ore, is closely related to tantalum because they are usually associated as a columbate and tantalate of iron and manganese.

^{*} Steam Shovel Mining in Nigeria, by the author. Inst. Mining and Metall., London, May, 1930.

Columbite may be one end of an isomorphous series of which tantalite is the other. The resultant mineral is known as either columbite or tantalite according to which is the predominant element. The Nigerian mineral is a low-Ta columbite averaging about 63 per cent Cb₂O₅.

The niobium, pyrochlore or koppite group are the only other minerals that contain commercial quantities of columbium. Intensive research and investigation, as to the economic extraction of the mineral from the usually fine grains of the pyrochlore group, is being carried out with a view to ensuring future reserves of the mineral.

Meanwhile, the Nigerian deposits are an indispensable source of supply to satisfy present world demand for columbite.

RELATIVE VALUES

Because of its essentiality, columbite the by-product has commanded a price of more than double that of the basic mineral tin. The price is based on a unit value of 320 shillings which has resulted in a selling price of £1,000 per ton and even more, depending on the value of the concentrates.

To satisfy the stockpiling requirements of the American Government, a bonus of 100 per cent was paid to all producers, after May, 1952, as an inducement to secure maximum recovery. This in effect has doubled the basic price of the mineral.

In addition, D.M.P.A. has provided loans to some companies for the development of columbite areas. Such loans are repaid in columbite concentrates.

Tin prices have followed the not unusual irregular curve, and after reaching a record peak of £1,600 per ton in 1952, have now fallen to less than half that figure. This unfortunately has been a feature of tin prices down the years, resulting from depressed periods in industry or alternatively, artificial stimulation. Maxima and minima price variation from £100 to £200 per ton is also indicative of the unstable value of the mineral.

FUTURE OUTLOOK

All the conditions point to an assured future for the Nigerian field.

The demand for columbite alone is a guarantee of higher prices and steady working, factors that permit of organized planning ahead for large scale operations and a consequent reduction in production costs. At the same time financial loans make it possible to carry out extensive exploratory work to locate new mineral reserves.

Tin producers can look forward to more stable conditions as a result of the plans of the new Tin Agreement. Even a controlled output, with prices fixed between £640 and £880 should at least permit of planning ahead for steady and regular operations.

The country is safeguarded against the possible exhaustion of the alluvial columbite by the probability of the mineral being found in economic quantities in the primary granites. Already exploratory work is being carried out in the granite underlying the deep lead alluvials below the basalt capping, and in at least one case, it is reported that the granite contains up to ½ lb. of columbite per cu. yd.

Also, investigations are proceeding as to the payability of the low grade deposits of pyrochlore which are known to exist in the Kaffo Valley granite, where there is a possibility of a valuable source of both niobium and uranium.

The time may not be far distant when tin in Nigeria may ultimately be simply a by-product of the basic rare earth mineral production.

Arc Refining Beryllium

Described as a new approach to chemical and metallurgical technology, a new process for refining beryllium, known as the Sheer-Korman High Intensity Arc Process, which promises to substantially reduce costs of the metal and open up wide new markets for its use, has been announced by Light Metals Refining Corporation, N.Y.

In the operation of the process, the raw ore is first crushed and made into rod-shaped electrodes containing about 30 per cent of low-grade soft coal. In the next step the rods are baked to make them electrically conducting and then are consumed continuously in an arc furnace by means of a high intensity arc, struck between the opposing ends of two such rods. The high intensity arc, similar to that used in large military searchlights but never before used in a chemical process, causes the material of the rods to vaporize rapidly from the ends. The temperature achieved is estimated to be in the range of 15,000 to 20,000 deg. F.—hotter than the surface of the sun—and intense enough to instantly vaporize any known substance.

Thus, the ore material is completely broken down to its elements and ejected from the arc into the atmosphere of the furnace as a long flamming jet at a speed in excess of 100 m.p.h. Chlorine gas is simultaneously fed into the furnace, which mingles with the vapour jet as it cools, and converts the metallic constituents of the ore quantitatively to their chlorides. The chloride vapours are then piped to a series of condensing chambers in which each of the different chlorides is successively condensed out in pure form. As a result, not only is pure beryllium chloride obtained, but also, in the case of beryl ore, sizeable quantities of pure aluminium, iron, and silicon chlorides. These constitute valuable by-products at no extra cost.

The final step in the production of metal is the electrolysis of beryllium chloride directly to the beryllium metal and to chlorine gas, the latter being then returned to the process.

INDUSTRIAL APPLICATIONS

To date beryllium's use in industry has been limited because of the high cost of its production by present methods and because of the inferior quality of the metal so produced. At present its price is approximately \$100 per lb. in ingot form. But even at this price the metal is so brittle that it cannot be machined readily by conventional means and generally fabricated forms must be made by power metallurgy techniques. This increases the cost of finished parts to two or three times the cost of the metal.

Both Dr. Sheer, vice-president of the company and research associate in nuclear physics at Columbia University, and Dr. Samuel Korman, general manager of the company and co-inventor of the process, believe that the cost of beryllium metal can be cut by as much as 75 per cent by the new process. They added that high intensity are smelting, moreover, yields a nearly pure, non-brittle and readily machineable metal.

Meanwhile, Light Metals Refining Corporation is planning to build a control-type plant in the New York area for the production of 10,000 lb. of beryllium a year. The company said that this type of plant differs from a pilot-plant in that it will combine production with research to enable the company to receive some income while at the same time permitting it to perfect the new process under actual production conditions.

Aside from its use for beryllium, inventors of the process said that aluminium, magnesium, lithium (the only metal lighter than beryllium), titanium and tungsten also could be refined by high intensity arc smelting.

Spectrographic Techniques in Mineralogy

The increasing use of spectrographic techniques by mineralogical chemists for qualitative and quantitative analyses is of marked importance to mining engineers, as by means of spectrographs atom or molecule types can be identified in a sample material. The following article describes the spectrographic techniques used in mineralogy, which allow for the identification of minerals difficult or impossible to recognize by other methods.

A spectrum is an arrangement of radiation in order of wavelengths. Electromagnetic radiations have been discovered that have wavelengths of every value from thousands of kilometers to trillionths of a millimeter. Since there is no instrument in existence capable of separating wavelengths into a spectrum over such an enormous range, the electromagnetic spectrum has been divided for convenience into several regions, according to the types of instrument available.

Spectroscopy—in the usual sense of the term—is the study of those radiations which lie within the infra-red, visible, and ultra-violet regions. It is concerned only with those electromagnetic waves which can readily be separated into a spectrum by means of prisms, optical gratings and optical interferometers.

INCREASING USE IN ANALYSES

Because of their sensitivity and of the speed and convenience with which they can be applied, spectrographic techniques are being increasingly used by mineralogical chemists for both qualitative and quantitative analyses. The basic principles are far from novel. One of the earliest investigators of the spectrum was Sir Isaac Newton, who in 1660 inserted a prism in a beam of sunlight shining into a dark room and observed a band of colour on the wall. By using a lens in conjunction with the prism, Newton was able to spread the colours into a fairly pure spectrum 10 in. long. He failed to produce a spectroscope of modern type only because he let the light shine through a round hole instead of a narrow slit. The first practical spectroscope was developed in 1859 by G. R. Kirchoff and R. Bunsen, who showed that this instrument could be used as a new means of qualitative chemical analysis. With it they discovered new elements and were able to discern the presence of many known elements in the sea.

It was subsequently found that many minerals and organic materials fluoresce strongly in ultra-violet light, converting the invisible radiation into visible light. This is of great importance to mineralogists. In fluorescence spectroscopy the specimen is shielded from extraneous light and is then illuminated with ultra-violet light, the usual source being a quartz mercury lamp covered with a filter that removes visible radiation. Some mineral specimens are likely to glow brightly and can often be identified by the colour of their fluorescence.

Most spectroscopes contain three main elements; a slit through which light is transmitted; a dispersing device such as a prism or a diffraction grating which separates the radiation according to wavelengths; and a suitable optical system to produce the spectrum lines.

Diffraction gratings have been used for more than a century, their use in spectroscopy has hitherto been limited by difficulties in ruling and reproducing high quality gratings, which have up to 30,000 parallel lines to the inch. The gratings currently used in spectrometers have three times the linear aperture of the most commonly used prisms and might be expected to have a corresponding advantage in resolving power. They are reported to give dispersions exceeding those of single prisms at all wavelengths longer than about 2,500 A.

Both types of instruments have certain advantages and limitations. The same grating spectrograph can be used for work in the ultra-violet, visible and near infra-red regions, whereas a prism instrument requires at least two sets of optical parts to cover these regions satisfactorily. Quartz prisms and lenses are usually employed for the ultra-violet region, glass for the visible, and rock salt, fluorite, lithium fluoride or potassium bromide for the near infra-red.

One of the disadvantages of grating spectrographs is that the various orders of a grating overlap, but undesired orders can usually be removed by filters or by crossing with another spectrograph, which may be one of low dispersion. Gratings are also apt to be wasteful of light, since as much as 50 per cent of the light sometimes goes into the undispersed central image and 60 per cent of the remainder into orders not being used. This limitation has been overcome by the selection of diamond points so shaped that they engrave rulings which throw much of the light in one general direction.

Gratings are also apt to confuse the operator by showing false lines on the spectra which are known as "ghosts." These are produced by periodic errors and other irregularities during the ruling process. Though ghosts can usually be distinguished visually from the lines of spectra, their presence has led to many errors in spectrographic analysis.

Of great potential importance to spectrographers is a process developed at the National Physical Laboratory by which it is now possible to produce helical gratings having up to 30,000 threads an inch, which are free from the periodic errors which cause "ghosts." In this process a helix with a pitch equal to that of the required grating is cut on one half of a polished metal cylinder. This helix is impressed by means of a diamond tool, a suitably geared-down screw-cutting lathe being used, and is simultaneously copied on the other half of the cylinder after the periodic errors have been absorbed by a Merton nut. This device consists essentially of a guiding nut lined with strips of a soft elastic material, which are clamped to the rotating screw thread, the nut itself being restrained from rotation. A replica process capable of producing satisfactory flat copies from cylindrical gratings made by the Merton-N.P.L. process has also been devised.

QUANTITATIVE ANALYSIS

By means of spectrographs each type of atom or molecule can be made to produce a characteristic set of spectrum lines or bands by which its presence can be identified in a sample of material. More than half a million different atomic spectrum lines and innumerable bands have been observed. Since it is possible to measure the wavelengths with a high degree of accuracy, most spectrum lines can be identified without any possibility of error. The spectroscope is thus one of the most highly specific methods of qualitative analysis and it has the further advantages of simplicity and speed.

A small sample of the material to be analysed is burned in an electric arc, a spark, or any other suitable source of excitation, causing the molecules to be split up into their constituent atoms, which are then stimulated to emit light. This light is transmitted through a slit in the spectrograph and passes through a prism or grating, which separates the various radiations and records them individually as spectrum lines on a photographic plate. The plate is developed in the usual manner and is then available for projection when required. Besides providing a permanent record, this technique

makes it possible for junior staff to carry out the routine parts of an analysis, the results being later studied by experts.

This method is particularly valuable when the sample is extremely small and when the operator does not know what elements it is likely to contain. As little as 1 milligram is sometimes sufficient for a complete qualitative analysis. The sensitivity of the method varies from element to element but amounts of certain elements as small as 10° can be detected in concentrations of less than one part in 100 million.

MINERALS IDENTIFICATION

Spectrographic techniques are being used to identify minerals which are difficult or impossible to identify by other methods. The rare earths, for example, are difficult to separate chemically and samples are often extremely small. Spectrographic methods can be applied quantitatively to the determination of any element that can be detected qualitatively. Over seventy elements of the periodic table are susceptible to this method, which is more rapid than chemical wet methods and can be carried out on much smaller samples. The elements usually regarded as unsuitable for spectrographic analysis are the permanent gases, the halogens, and sulphur. On the other hand, the spectrograph can usually be relied upon when the elements to be determined are metallic or metalloidal, when the chemical combinations in which they are present in the sample need not be determined, and when the combined concentrations of the elements of interest are less than about 5 per cent of the entire sample. Accuracies within 2 per cent of the element being determined are sometimes possible, irrespective of the actual concentration. It is as easy to determine between 0.0010 and 0.0011 per cent of lead in gold as between 0.10 and 0.11.

A technique widely employed for quantitative analysis is based on approximations and is most readily explained by considering its application to a particular type of problem. In order to determine, for example, the amount of platinum present in a sample of palladium, a series of otherwise identical palladium samples with controlled platinum contents is prepared. These standards and the "unknown" are burned in a uniform manner in an electric arc. From the spectrograms are selected the two standards with Pt lines most nearly identical with those of the unknown. A new series of standards intermediate in Pt content between these two standards is then prepared, this procedure being continued until the Pt lines of a standard are found to be identical in intensity with those of the unknown. This standard can then be assumed to have the same concentration of Pt as the unknown. In practice, this procedure can often be simplified by plotting a working curve of concentration against intensity of light emitted under controlled conditions

WORK OF THE GEOLOGICAL SURVEY AND MUSEUM

Spectrographic methods are being extensively used by Britain's Geological Survey, which is equipped with a Carl Zeiss instrument of medium size and also a larger Hilger Littrow spectrograph having both quartz and glass systems. The latter instrument was acquired at the beginning of 1951, but much preliminary work had to be accomplished before it could be used for the qualitative analysis of minerals of unknown composition. This work included the preparation of master wavelength plates of the iron spectrum, from which celluloid working scales were made; the micrometic determination of plate factors; the preparation of a chart for preliminary qualitative examination by a projection method; and the preparation of 63 reference plates for the spectra of individual elements. The instrument is now being

used for qualitative work over the range 2,700-4,600 A.

In developing suitable techniques for their own requirements, the Geological Survey have three main objectives, which have been defined as follows:

- (a) Improvements in qualitative techniques for examining minerals of unknown composition:
- (b) Development of an accurate spectrochemical method for determination of the rarer alkali metals in rocks and minerals. After preliminary experimental work, spectrographic determinations of lithium and rubidium are now being made in specimens submitted for chemical analysis and a long-term study of the accuracy of the method is being made:
- (c) Development of a general method for the detection and approximate determination in minerals and rocks of about thirty of the rarer elements.

Good progress has been made with the third section of this investigation. Direct general methods, in which the specimens to be examined vary considerably in composition, often provide only approximate information, partly because of uncertainties regarding the effect of major composition on the excitation of atoms of the minor elements. This uncertainty can be reduced by diluting the sample with a suitable "buffer" to maintain more steady conditions in the arc. The experimental work in progress at the Geological Survey laboratories is based in anode excitation in a high amperage D.C. carbon arc in the presence of a calcium sulphate "buffer." The dilution with calcium sulphate reduces the number of trace elements detectable in many rocks, but gives more confidence in the results obtained for the less rare elements.

All spectra are stepped by means of a rotating stepped sector to facilitate visual estimations and to enable a photometric constant density method to be applied when desirable, certain lines being used as the internal comparison lines. Work is in progress to eliminate uncertainties caused by the presence of traces of some rarer elements in the base used for preparing the standard mixtures.

SPECIFIC INVESTIGATIONS

The general method has been used for semi-quantitative work on a coal ash which was found to contain beryllium, chromium, cobalt, copper, germanium, indium, lead, manganese, nickel, vanadium, yttrium, zirconium and silver. It has also been used to determine vanadium and other rarer elements in carbonaceous specimens and gallium in wolframite and muscovite. Gallium, nickel, strontium, vanadium, yttrium and zirconium have been determined in dolerites. Nickel, cobalt, molybdenum, lanthanum, yttrium, scandium and zirconium were found in quite easily detectable percentages in bottom clay from the North Pacific Ocean. A spectrographic study of the rarer elements of Fuller's earths and British lignites has been commenced.

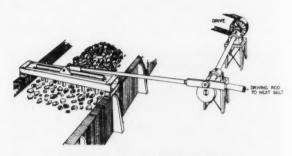
In another investigation 41 specimens of gypsum, anhydrite, barite and celestine were examined by spectrographic methods specially developed for the purpose. The accuracy of the methods was studied by making many repeat determinations and by chemical analyses of three of the specimens. Agreement with the chemical determinations was well within ± 10 per cent.

Specimens examined qualitatively to assist with identification have included tantalum, niobium, thorium, uranium, vanadium, and titanium-bearing minerals containing minor percentages of other rarer elements, a titanium-bearing haematite, a sulphate of lead, and a litho-alumino-silicate. Among other minerals examined were small specimens of sulphide minerals, a lithium mineral, a nickel mineral, and minerals containing rare earths and other rare elements. One very complex mineral was found to contain Y, Nb, U, Ti, Zr, Th, La, Yb, Pb and V.

Technical Developments in the Coal Mining Industry

Periodically The Mining Journal publishes comprehensive notes on developments in the design of mining machinery which are the result of the thought and efficiency of men employed in collieries of the United Kingdom. The article which follows comprises two notes on these current developments, together with a description of a new continuous miner which has been designed and built in the United States.

A labour saving device, simple in operation, which distributes and turns over coal on the screens so that middlings can be more easily picked out has been developed at Wheldale Colliery. By its installation, the two men who were formerly employed with hand rakes to perform the task have been released for other duties. Whereas previously it was not possible for a man to continue raking all day, this device ensures that the rakes are in operation whenever the belt is running, resulting in more efficient screening.



Diagrammatic view of mechanical rake

Under conditions of normal loading the coal feed can be properly spread on the picking belt and there will be no need for a device of this nature. In distributing the feed over the surface of the belt, the device would, however, perform a very useful function where belts are heavily overloaded or are fed unevenly with coal.

In the operation of the mechanical rake, a suitable rotary drive and crank is employed to impart a reciprocating motion to the rake which moves between two channel iron guides spanning the picking belt. The rake itself comprises a channel iron carried on three sets of ball bearing mounted wheels which run on the flanges of the two guides. To the underside of this channel are bolted four inverted, two-prong forks each fixed at an angle of 30 deg. to the axis of the rake. The height of the rake is adjusted by packing at the ends to allow a clearance of $\frac{1}{8}$ in. between the picking belt and the ends of the forks, and a $\frac{1}{4}$ in. thick plate located beneath the belt retains it in position.

A NEW CONTINUOUS MINER

A continuous mining machine that uses a pair of vibrating hammers to knock coal from the face of a mine has been invented in America by a United States Steel Corporation executive and is now being put on the market for general use. A mine equipped with the new machines can turn out two-and-one-half times as much coal per man daily as an average mine using conventional methods. Forty of the 23-ton machines already are at work in three U.S. Steel mines; the company eventually plans to use the machine in all its mines.

Jeffrey Manufacturing Co., Columbus, Ohio, has purchased patent rights on the machine from the inventor, and has prepared for quantity production.

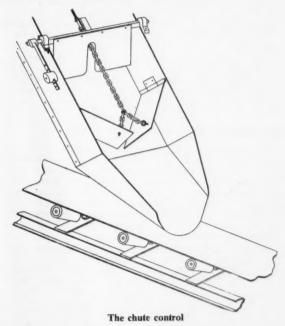
The front part of the machine is equipped with twin

cutters that slice two horizontal cuts in the mine face. Two more cutters produce vertical cuts to block out a section, which is then broken up by the vibration. Then a pair of silicon-nickel steel hammers mounted on the machine deliver 1,800 blows of 15 tons each every minute to the section. As a result, the need for blasting is minimized or eliminated.

Dust created by the cutting and hammering is settled by water sprayed from nozzles on the same machine. Mounted on caterpillar treads, the miner is $4\frac{1}{2}$ ft. high, $6\frac{1}{2}$ ft. wide and, including the conveyor, is 30 ft. long and weighs 23 tons. Power comes from a single 70 h.p. electric motor. Counting auxiliary equipment, the cost of the machine is estimated between \$125,000 and \$130,000.

A COLLIERY CHUTE CONTROL

A chute control, designed at Bolsover Colliery, Derbyshire, regulates the flow of coal when discharging into the chute is intermittent. A swinging door, bolted to a shaft which is fitted across the flat-bottomed chute, is counterweighed to hold it in the closed position. A slot is cut in the centre of the door and through this passes a chain about 5 ft. long and divided into a "Y" at its lower end; the upper end being connected to the swing door by a bar and eyebolt. Two dampers, hinged vertically on the sides of the chute, are attached to the ends of the chain.



There is a gap between the swinging door and the chute bottom to allow a small quantity of coal to pass at all times. Above this amount, the hinged dampers hold back the coal until sufficient weight has been built up in the chute to operate the swinging door. The coal has roughly the same velocity as the conveyor belt when its leaves the chute lip, and this helps to reduce abrasive wear on the belt surface.

MACHINERY AND EQUIPMENT

A Free-Piston Compressor

Mackay Industrial Equipment Ltd. have been appointed sole distributor in England, Wales, Northern Ireland and Eire of the Pescara-Muntz free-piston portable air compressor. The Pescara-Muntz compressor is a British machine now being produced on a large scale by Alan Muntz and Co. Ltd., United Kingdom and British Commonwealth licence holders of the Pescara patents.

The P.42 compressor is an example of a free-piston compressor in one of its simplest forms. The power unit comprises a single diesel cylinder (bore 4.25 in.) in which two opposed diesel pistons work a two-stroke cycle, one diesel piston being connected directly to the compressor piston working in the compressor cylinder, while the other diesel piston is connected directly to a cushion piston working in the cushion cylinder, the compressor end providing the working compressed air, while the cushion end does the work normally performed by a flywheel in providing return energy to maintain the firing cycle.

The two groups of moving parts are kept in phase by a lightly loaded link gear connected at the outboard ends to crossheads on the piston rods, and at the inboard end to rocking levers carried on rocking shafts.

The two groups of pistons and their connecting linkage comprise the moving parts of the P.42 compressor and replace the normal arrangement of two crankshafts, connecting rods, highly stressed bearings and the necessary clutch or couplings of the conventional type engine-cum-compressor set. The two groups of moving parts are equal in weight and opposed in motion, so that the engine operates with a complete absence of vibration.

Unlike conventional engine/compressor sets where the stroke of both the engine and the compressor is fixed, the stroke of the free-piston engine/compressor varies. In the case of the P.42 the variation is from 5.25 in. at no load to 5.98 in. at full load. The rated output of the P.42 compressor is 105 c.f.m. at a maximum operating pressure of 100 p.s.i. and it is capable of driving two of the heaviest paving breakers or equivalent equipment.

Fuel consumption under normal working conditions is approximately seven pints per hour. The individual weight of the engine/compressor unit only is 2,240 lb. approximately. Compressor complete with heavy duty trailer and canopy weighs 3,400 lb. approximately.

The British Electric Power Convention, 1954

The sixth British Electrical Power Convention was held at Eastbourne from June 14 to 18 as a successor to the Incorporated Municipal Electrical Association Convention of 1948. Delegates met under the Presidency of Mr. J. R. Beard, C.B.E., who represented the Association of Consulting Engineers. The principal paper was by Sir George H. Nelson, F.C.G.I., M.I.Mech.E., M.I.E.E., F.R.S.A., chairman and managing director, The English Electric Co. Ltd., who spoke on "Electrical Engineering in World Trade."

Owing to Sir George's absence on business overseas, the paper was presented by Mr. H. G. Nelson, M.A., A.M.Inst.C.E., M.I.E.E., A.M.I.Mech.E., deputy managing director, The English Electric Company Ltd. Sir George stated that he would illustrate the subject of utilization of electric power by dealing with typical industries in which electricity played a vital part. "My first choice is the mining industry," he said.

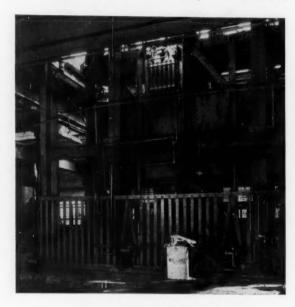
Present development in mining practice and technique was to use a semi-automatic or fully automatic control, and South African mining houses were interested in semi-automatic control to deep shaft application to depths as great as 5,000 to 6,000 ft. Over recent years the development and improvement in DC dynamic braking of A.C. winders had led to this requirement becoming an integral part of the equipment. As a result, many equipments which in the past would have been controlled by the Ward Leonard principle were now installed as A.C.

units. The reduction in the number of main machines required to perform a given duty, resulting in lower capital cost and maintenance, was particularly important to overseas buyers, because shipping and freight charges were less. This reduction in the amount of equipment had been of special importance in the South African goldfields, where the winding engine was installed underground.

Koepe pulleys instead of drums were becoming popular for shaft winding, due to the much reduced inertia of the pulley compared with the drum. In the reorganization schemes of underground working, there was increased use of electric locomotives for haulage purposes both in the U.K. and in overseas countries, the trolley locomotive being used for non-fiery mines and the flameproof battery type for fiery mines.

Automatic Lubrication of Mine Cage Guides

The lubrication of cage guide ropes and rails has always been a vexed problem. Resulting from the collaboration between the Gulf Oil Company (Great Britain) Ltd. and Tecalemit Ltd., a lubricant has been compounded called Gulf



The lubricator on the cage side

Cage Guide Lubricant RB2/45, which has the ability to displace water from bearing surfaces by a tough unbroken lubricant film without draining down the guide. The lubricator consists simply of a charging block, a lubricant container and a six-way regulator.

The lubricant container, for convenience of installation and to minimize head room, consists of six cylinders, each having a spring-actuated piston, each cylinder being connected to a common manifold—the pipe from the manifold being taken to a special six-way regulator which provides six adjustable oil feeds to the top shoes. The lubricant RB2/45 is automatically transferred to the pump shoes by the normal movement of the cage. The lubricant cylinders are charged from the charging block which is connected to the manifold by a pipe.

The charging block is provided with a heavy duty giant button head nipple, through which the lubricant is introduced into the cylinders by a standard portable hand-operated Tecalemit volume pump, with a flexible hose and connector. The lubricant cylinders have a total capacity of one gallon for 24 hours continuous supply. The overall size of the frame carrying the six cylinders is approximately 2 ft. 6 in. x 1 ft. 6 in.

TECHNICAL BRIEFS

Gas Effects on Metals

Engineers at the (U.S.) General Electric Company's materials laboratory, America, are using a newly-perfected vacuum fusion gas analyser to study the effects gas content in metal has on its physical characteristics. The presence of small amounts of the gases oxygen, nitrogen and hydrogen is known to affect the physical properties of any metal, particularly titanium and molybdenum.

The vacuum analyser, under development since 1948, is believed to be the only accepted method for determining the oxygen content in metals. The basis for the method lies in the fact that room temperature above the melting point of the metal and under a vacuum, oxides can be reduced by carbon and made to give up their oxygen quantitatively as carbon monoxide. At the same time, any hydrogen or nitrogen present as hydrides, nitrides, or as the free elements are thermally decomposed and released as elemental hydrogen and nitrogen.

In the vacuum analyser, the solid metal sample (about 0.25 grams) is melted in a graphite crucible under a vacuum. In 20 to 30 minutes the sample gives off all its gases. These gases are pumped by mercury diffusion pumps through an all-glass system to an analytical system of known volume where their total pressure is measured using a McLeod gauge. They are then circulated through three traps in series.

The first trap is copper oxide at 325 deg. C. which oxidizes the carbon monoxide and hydrogen to carbon dioxide and water respectively. The following trap removes the water in anhydrous magnesium perchlorate. The carbon dioxide is next removed by freezing in liquid nitrogen at -195 deg. C. The pressure of the remaining nitrogen is measured after which the carbon dioxide is allowed to vaporize and its pressure is measured. Hydrogen values are obtained by the difference. Extraneous gases from within the system are compensated for by running a separate blank analysis on them. The apparatus can determine 10 parts per million with an accuracy of plus or minus 10 per cent of the amount present.

Treatment of Titanium Ore

An interesting description of the plant for the mining and concentration of titanium ore operated by the Humphreys Gold Corporation for Du Pont has been given by Carpenter et al. (Trans. Am. Inst. Min. Met. Eng., 196, Tech. Publn. 3567 AH). Owing to the fact that the ore is of a sandy nature and the water level high, the plant, capable of processing 20,000 tons a day, was built on three barges. Spiral concentrators in the wet mill produce 45 tons of concentrate per hour from approximately 1,100 tons of ore. In the dry plant, titanium minerals are separated from the silicate minerals by high tension electrostatic separators in which the minerals are fed on to a high speed spinning rotor. A heavy corona discharge is directed towards the point on the rotor where the minerals are normally ejected. The silicates present in the ore are poor conductors and acquire a high charge. They are pinned to the rotor by this charge and removed by a fixed brush. The titanium minerals, on the other hand, are good conductors, do not retain the charge and therefore leave the rotor in a normal trajectory. The minerals from the high tension separators are then magnetically separated to obtain the ilmenite.

A Metal Refining Technique

A new technique of refining metals to nearly perfect purity is announced by the Bell Telephone Laboratories, America. In the new method a long, thin strip of the metal to be purified is mounted beside a track along which travels a circular electric heater. The circular heater surrounds the strip and melts it at about 1,760° F. The heater moves down the strip and thus produces a molten zone that travels from one end of the strip to the other.

Since most impurities are more soluble in molten material than they are in the same substance in its solid state, the molten zone sweeps the impurities to one end of the strip. The impure section is then cut off and discarded,

REVIEWS

Horizon Mining, by C. H. Fritzsche, Dr.(Eng.), Ph.D., and E. L. J. Potts, M.Sc., M.I.Min.E. Published by George Allen and Unwin. Pp. 614 with index and over 400 illustrations. Price 75s.

In an interesting foreword, E. H. Browne, director-general of production, National Coal Board, points out that differing geological conditions in British and Continental coal mining areas have promoted different techniques of exploitation. On the Continent horizon mining has been a necessity from the initial stages of working in most cases, and now in the United Kingdom it is generally recognized that the horizon mining system is often necessary for the economic exploitation of deeper coals. The system may be modified and its techniques may be considerably varied in different areas. The N.C.B. have therefore secured the services of Professor Fritzsche to provide a textbook on horizon mining designed for use by the British mining engineer, with Professor Potts to provide the essential background of British conditions. The authors are respectively professor of mining at the Technical University, Aachen, and professor of mining at King's College, University of Durham.

The work is of specific interest throughout, and chapters deal in turn with the general principals of the horizon mining system, strata control and subsidence, development in stone and in coal, transportation and ventilation. In all, this book is of real value to the mining engineer, a particular facet of its production being the clearness of the explanations which adds greatly to its value and enhances its worthy purpose.

Metalliferous mining engineers will be interested in this adoption of a system that is traditional in the hard-rock mine.

Quin's Metal Handbook, 1953 edition. Published by Metal Information Bureau Ltd. Pp. 786. Price 25s., post free. Copies obtainable from the publishers at Birkett House, Albermarle Street, London, W.I.

This new issue, the fortieth edition, is considerably larger than any of its predecessors and contains extensive details relating to prices, production, consumption, exports, imports, brands, stocks, analyses, properties and uses, weights, metal diaries, memoranda sections, etc. Wherever possible, the latest and most comprehensive data has been included.

An interesting new feature is the inclusion of estimated world production and consumption figures of copper, lead, zinc and tin for the year 1953. For the first time for fourteen years daily prices for copper, lead and zinc are published again. Many extra statistical tables have been added and figures generally are more up-to-date as official sources have speeded up the dissemination of these vital facts.

SIR ERNEST OPPENHEIMER'S SURVEY— A CORRECTION

There was an unfortunate transposition of type when going to press last week in the third paragraph of our note on page 734 discussing Sir Ernest Oppenheimer's statement to Anglo American Corporation shareholders. This paragraph should have read:

"It is therefore greatly to the credit of the Anglo American Corporation that in this climate of financial scarcity the great schemes envisaged under their post-war plan have been carried through. There are several reasons for the corporation's success in being able to command large sources of capital, not only for bringing its own enterprises to fruition, but also for assisting the development of the undertakings of other organizations, the most important of which lies in its highly successful record and the efficiency of its technical direction, which has attracted the confidence of important investors both in the United Kingdom and continental Europe."

Perhaps the best comment on the extent of this achievement lies in Sir Ernest's belief that the major task of financing the group's seven O.F.S. mines has now been completed—and, moreover, completed during a period when the internal economy of South Africa has been under considerable strain and when foreign investment has scarcely been encouraged by the trend of political events in the Union.

METALS, MINERALS AND ALLOYS

President Eisenhower has asked Congress for a supplementary appropriation of \$380,000,000 for stockpile purchases of strategic and critical materials to be expended over an unspecified period from July 1 next. If approved this appropriation will presumably provide the basis for O.D.M. directives to the G.S.A. for the new fiscal year. Instructions so far issued have related to purchases only in the current year. A statement from the White House suggests that the President's Committee on Minerals Policy may be recommending an extension to the objective of the stockpile programme. As, however, we don't know, and apparently are not to be told, what the present objectives are, this hint takes us very little further.

The suspension of the import duty on copper is now assured at least for another year and on crude bauxite for another two years. These suspensions will still, of course, be subject to domestic prices remaining above the levels at which import duties would be automatically re-imposed.

COPPER.—The currently tight copper position was emphasized in the American Copper Institute's statistics for May, extracts of which are summarized in the table below. The most notable feature of these returns was the sharp contraction in U.S. refinery stocks which declined over 42,000 s.tons on the month. Stocks outside the States have also recorded some decline resulting in the total stocks of refined being down by some 60,000 s.tons on the month.

		Production	Stocks			
	May	JanMay	JanMay	May 31	Apr. 30	May 31
	1954	1954	1953	1954	1954	1953
U.S.A Other countries* World	108,403	553,615	553,275	82,111	124,523	52,762
	95,564	433,099	488,392	255,234	273,070	147,234
	203,967	986,714	1,041,667	337,345	397,593	199,996

* Excluding U.S.S.R., Japan, Australia, Norway, Sweden and Yugoslavia.

The decrease in U.S. stocks is apparently almost entirely accounted for by stockpile deliveries arising out of the 100,000 tons contract with the Chilean Government. It is understood that about 40,000 tons were delivered to the stockpile in May and deliveries are expected to be completed by August, if not sooner.

Messages from New York last week reported signs that the strength of overseas demand for American scrap copper was at last easing to a point where the premium on export prices over the domestic refinery price was disappearing. This development will be particularly welcome to U.S. refiners if the present active demand for copper continues. By the beginning of this week copper sales for June shipment to the U.S. domestic market had topped 90,000 tons and consumer demand was already being felt for August shipment. Custom smelters are reported to be entirely sold out for June and to have only small quantities of July metal left.

LEAD/ZINC.—The tone of the market for both these metals steadied in New York at the end of last week following the issue of new purchasing directives to the G.S.A. under which it was instructed to buy "at the market" rather than at the undisclosed maximum price under which the original invitations to offer had been made. The London market has, however, continued to show an easier trend compared with last week's prices and there is thus no immediate likelihood of the American price reverting to the 14½ c. basis from which it was dislodged following the disturbing manner of the G.S.A.'s entry into the market.

Although, as readers will be aware, the Administration does not propose to disclose the size of its stockpile purchases, good guessers in the industry were venturing estimates of G.S.A. purchases of lead up to last week-end at between 5,000 and 8,000 tons and of zinc at between 10,000 and 12,000 tons. In any event these G.S.A. purchases have not done much to brighten up the demand for either metal which suggests that the market had already discounted this factor and is now presumably awaiting the President's decision on tariffs.

In particular it is zinc which continues to exhibit a weak statistical position and American smelters' stocks at the end of

May were again substantially up at 209,828 s.tons compared with 200,740 s.tons at the end of April, and with 92,452 s.tons at the end of May a year ago. The G.S.A. looks like having to buy a lot of zinc if it is to bring these stocks back to more manageable proportions, and to support the price up to a 13 c. level which it has been suggested may be its intention.

TIN.—In Washington last week the House of Representatives Banking Committee approved the Thompson Resolution providing for the continuation of the Texas smelter for another year. A similar Bill has already been passed through the Senate. One provision of the Thompson Resolution is apparently that the tin produced during the period of the smelter's continued operation should be turned over to the national stockpile under the new stockpiling programme. If this is done an interesting precedent will have been established, running contrary to the expressed intention of the new stockpiling policy of confining purchases to newly mined domestic metal. However, it should be easy enough for the Administration to make out a special case for tin, given that they are now committed to operate the smelter for another year. Certainly such action would ensure that the tin market will be in no danger of having to digest surplus stocks before next year, by which time the machinery of the International Tin Agreement may well be in operation.

With the Reconstruction Finance Corporation due to go out of existence at the end of this month President Eisenhower has had to re-allocate the activities of this Corporation among other Government agencies. The operation of the Texas smelter has, under an executive order, has been transferred this week to the Secretary of the Treasury, who is instructed to establish the Federal Facilities Corporation to operate the smelter. This Corporation will also be responsible for operating the Government's 26 synthetic rubber factories.

ANTIMONY.—Speaking at the annual general meeting of Consolidated Murchison this week the chairman referred to the improvement in the antimony ore market compared with the latter half of last year. He added that present indications pointed to the possibility that the existing level of demand might continue through to the end of this year. Confirmation of this more optimistic view appears to be forthcoming at present from New York where the price of imported ore has again recorded some improvement and was being quoted at the end of last week at \$325-335 per unit for 50-55 per cent ore, and \$415-425 per unit for 60-65 per cent ore. At the same time, as the chairman of Consolidated Murchison warned shareholders in his speech, export antimony markets are still very competitive and, with the trend in this market unpredictable, any assessment of the future must be treated with caution.

TITANIUM.—The text has been made public in Washington of the hearings on titanium before the Minerals, Materials and Fuels Economic Sub-Committee of the Senate Interior and Insular Affairs Committee held to consider accessibility of strategic materials in time of war. Two points emerge from this evidence which, even if only confirmatory, are nevertheless of interest. In the first place evidence before the Sub-Committee appears definitely to have confirmed the need for a titanium production target of at least 150,000 tons per year within five years or possibly less. This compares with current production of around 2,000 tons and an immediate production goal of 35,000 tons. It seems to be no exaggeration to say that the whole of the long term development programme of supersonic aircraft may have to be geared to the rate at which titanium production can be stepped up.

A second point of particular interest to countries outside the States with substantial deposits of ilmenite and rutile emerged from testimony which pointed to the fact that there are at present more known deposits of ilmenite in the States and Southern Canada "than could be used in a century."

TUNGSTEN.—As from July 1 private buyers of wolfram ore in the U.K. will be permitted to meet up to 75 per cent of their requirements from overseas purchases (compared with 25 per cent as at present). The remaining 25 per cent of their requirements will still have to be obtained from Ministry of Materials' stocks. This marks a further stage in the transition from public

to private trading—first resumed at the beginning of last April—which should help towards broadening and steadying the market. Also it may presumably be deduced from this new announcement that Ministry stocks have now been run down to more manageable proportions, and indeed may, as some people in the trade believe, be nearing a level which the Ministry may wish to maintain as a strategic reserve.

Iron and Steel

On the threshold of the second half of the year, the outlook for the iron and steel trade is bright with promise. In U.S.A. production has taken a turn for the better: a similar trend is developing in Western Europe, and after some hesitation British consumers appear to have become reconciled to the recent rise in prices, and are issuing specifications more freely.

It may be of special significance that the small bar re-rollers, whose activities have been restrained for some months past by an almost total lack of export orders, are now receiving a few overseas inquiries and some definite orders. Some of the mills in fact are now back to full time working, although these conditions are exceptional rather than general. Still bigger orders have been placed with British tube makers, and shipments promise to be on a better scale in the second half of the year than in the first.

The most encouraging feature, however, is the strength of the home demand. The heavy mills are engaged on substantial rolling programmes and report a steady flow of specifications, which is probably stimulated by the assurance of prompt delivery. Plates and sheets are still in short supply but other classes of finished and semi-finished steel products are now readily obtainable.

Although pig iron production is running at or near record levels, supplies are still short and one of the most urgent needs is the operation of additional blast furnace capacity. Meanwhile, reserve stocks, though still substantial, are steadily falling and this despite the import of further tonnages from the Continent. Low phosphorous iron is especially scarce and engineering establishments are frequently compelled to use other grades of iron in their furnace mixtures. More basic iron is also needed for the steel plants but in this case small deficiencies can be made good by the more extensive use of scrap, deliveries of which are now on a satisfactory scale.

Coal is also a continuing source of anxiety to the makers of iron and steel. It is not merely scarce, but also costly and the use of oil fuel in the new steel plants is extending.

The London Metal Market

(From Our Metal Exchange Correspondent)

In spite of announcements that various countries intend to sign the Tin Agreement, activity in London has been on a reduced scale but with prices moving higher. The present price is above the discretionary buying limit envisaged for the Buffer Pool, and with the Texas smelter probably carrying of or another year prices may rise still more, and it is even possible to visualize a Gilbertian situation with the tin price rising to the upper limits of the Tin Agreement and with the Buffer Pool being in existence with no stocks. In such an event the control of the price would pass to the Americans with their so-called isolated stock of metal outside the stockpile. On Thursday morning the Eastern price was equivalent to £748½ per ton c.i.f. Europe.

Consumer demand for lead has remained good, although there has been a slight falling off in America which has resulted in an easier undertone in London. With the certainty that the U.S. Government will continue to purchase lead when the new fiscal year starts next week, and the probability of a corresponding reduction in supplies to Europe, the London price is expected to remain at least at its present level and some people even consider it will go higher.

The zinc market is completely without interest, and, as usual in such times, there is a tendency for prices to sag, but here again the long-term outlook must be for steady and slightly rising prices, although the process will certainly be longer

than in the case of lead owing to the existence of the heavy stocks in producers' hands in the States.

The copper market has settled down at the present level with only a small backwardation, and it is difficult to see how any major movement is going to develop as supplies are by no means plentiful, and at the same time producers show a marked reluctance to put their prices up. Consumer interest remains good, and demand throughout the world is at a level which is higher than anyone would have dared to predict six months ago.

Closing prices and turnovers are given in the following table:—

	June	e 17	June	24
	Buyers	Sellers	Buyers	Sellers
Tin				
Cash	£7254	£726	£7354	£736
Three months	£725	£726	£734	£735
Settlement	£7	26	£7	36
Week's turnover	575	tons	760	tons
Lead				
Current month	£974	£971	£961	£97
Three months	£95}	£951	£941	£95
Week's turnover	3,500	tons	2,000	tons
Zinc				
Current month	£80	£80#	£781	£781
Three months	£80±	£804	€791	£794
Week's turnover	1.375	tons	4,550	tons
Соррег			1	
Cash	£239±	£2394	£239±	€2394
Three months	£237}	£238	£2371	£2371
Settlement	£2	394	£2	394
Week's turnover	5,875	tons		tons

OTHER LONDON PRICES - JUNE 24

ANTIMONY

English (99%) deliver	ed,	
10 cwt. and over		 £210 per ton
Crude (70%)		 £200 per ton
Ore (60% basis)		 22s./24s. nom. per unit, c.i.f.

NICKEL

99.5% (home trade) .. £483 per ton

OTHER METALS

Osmium, £50 oz. nom.
Palladium, £7 10s, oz.
Platinum, £30/£31
Rhodium, £43 10s. oz.
Ruthenium, £23 oz.
Quicksilver, £95
ex-warehouse
Selenium, 35s. 9d. nom.
per lb.
Silver 73 d. f.oz. spot and 72 d. f'd.
Tellurium, 15s./16s. lb.

ORES, ALLOYS, ETC.

OKES, ALL	ors, Erc.
Bismuth	40% 6s. 3d. lb. c.i.f. 30% 5s. lb. c.i.f.
Chrome Ore—	/0
Rhodesian Metallurgical (lumpy)	£13 12s. per ton c.i.f.
Refractory	£13 4s. per ton c.i.f.
	£26-£27 d/d
	£10 - £11 d/d
Molybdenite (85% basis)	100 11 100
Wolfram (65%)	
	U.K. Selling 160s. + 10s.
" "	charges
Scheelite (65%)	*World buying price nom.
	. U.K. Selling 160s. + 10s. charges
Tungsten Metal Powder (98% Min. W.)	. 15s. 6d. nom. per lb. (home)
Ferro-tungsten	. 12s. 6d. nom. per lb. (home)
Carbide, 4-cwt. lots	
Ferro-manganese, home	CEA 15- 01
Manganese Ore Indian c.i.f. Europe	
(46%-48%)	(- 01 - · · ·
Brass Wire	2 (11 11 11 1
Brass Tubes, solid drawn .	In 107d non the best-

ex Ministry stock for prompt delivery from June 25

THE MINING MARKETS

(By Our Stock Exchange Correspondent)

Active and buoyant market conditions obtained last week and the underlying strength was emphasized by the continued rise in equities over the account day period.

Kaffirs were better on the spate of good news. Transvaal gold mining costs fell during May by an average of 9d. per ton. This is a significant reduction and the first real step in the right direction for a long time past. Some good gains were recorded by finance houses, especially those concerned with developing new gold and uranium properties.

Individual mines were also affected by the cost factor, especially the older properties which have the most to gain. Encouragement was also received from the Robinson Deep results, while the increase in profits from Randfontein were reflected in the price of the shares.

While the whole market received a tonic from Sir Ernest Oppenheimer's announcement that the major financing from the Orange Free State field was now completed, this section naturally reflected this statement to the full. Although prices were rather patchy, favourites like Harmony and Free State Geduld went ahead, encouraged by more rumours of good development results. It is understood that Johannesburg are now firm holders of most Orange Free State shares.

West Africans were still subdued, but quiet buying of Ariston was probably due to the optimistic medium term view taken in the market concerning this mine. More light was thrown on the position of Amalgamated Banket by questions at the meeting. Maximum tonnage on the new ropeway is taking longer to achieve than had been hoped for, and recruiting and training of satisfactory crews is likely to take another six months.

Miscellaneous gold shares were rather erratic. A good gain in Globe and Phoenix contrasted with a sharp fall in St. John d'el Rey. The chairman of the latter company expects that the mine will barely pay its way after the higher mining wages come into effect next month.

Diamonds were harder following the remarks by the chairman of Selection Trust concerning the current year's outlook for gem and industrial stones. De Beers Consolidated were helped by the statement concerning Orange Free State finances.

Coppers enjoyed a minor boom. The higher dividend by Nchanga surprised the market. Increasing confidence for the outlook for the metal and investment buying by large operators in London boosted share prices. Rhodesian Katanaga started the week in an erratic fashion due to uncertainty over the outlook for the property. It is understood that existing funds are nearly exhausted, but that Anglo American Corporation are considering the position and that the prospects are not unpromising. Later speculative buying caused an advance in the price of the shares.

Eastern Tins rose after the signing of the International Agreement by Indonesia. Sufficient producers have now signed this agreement for its implementation, but three more consumers are required. It is thought that these may well be forthcoming. It was again noticeable that properties having a potential long life were to the fore.

Nigerian tin shares were also affected, but to a lesser degree. Beralts advanced despite the slight decrease in the tungsten price. The President of the United States has asked Congress to vote more money for the purchase of strategic materials for the American stockpile.

This factor also affected Barriers, and caused good all-round gains. Buyers appeared for the shares due to the better outlook for the metal price.

In the miscellaneous metals group, favourite counters rose, conforming to the general market trend. Consolidated Murchison improved on the chairman's mildly optimistic statement.

Canadians were better and base metal shares led the way. There was, however, no change in Hollinger despite the news of increasing iron ore output by Canada.

INANCE	Price June 23	+ or -	0.6.5	Price June 23	+ or	MISCELLANEOUS GOLD		+ or -	TIM (Minutes and		+ or -
frican & European			Freddies	6/3			June 10	on week	TIN (Nigerian and	June 23	on wee
	216	*****	Freddies C			(contd.)			Miscellaneous) contd.		
Anglo American Corpn.	6	十書	Freddies Consolidated	21/3		St. John d'El Rey	17/6		Geevor Tin	11/71	+11
nglo-French	18/6	******	F. S. Geduld	4-9-	+4	Zams	35/6		Gold & Base Metal		-11
nglo Transvaal Consol.	23/9	+1/3	Geoffries	12/3		DIAMONDS & PLATINUM			Jantar Nigeria	9/6	+3
Central Mining (£1 shrs.)	32/-	+9d	Harmony	35/-	+3/6	DIAMONDS & PLATINUM			Jos Tin Area	13/-	6
onsolidated Goldfields	46/6	*****	Loraine	10/3	-3d	Anglo American Inv	57	+16	Kaduna Prospectors	2/6 -	
Consol. Mines Selection	31/3	+1/3	Lydenburg Estates	16/9	1+d	Casts	23/-	+6d	Kaduna Syndicate	2/44	
ast Rand Consols	2/71		Merriespruit	11/14	-41d	Cons. Diam. of S.W.A.	51	*****	London Tin	5/104	+41
General Mining	3#	+4	Middle Wits	12/6		De Beers Defd. Bearer		+2/6	United Tin	3/-	1 42
I.E. Prop	40/-		Ofsits	51/6	1.2/9	De Beers Pfd. Bearer	16%xD			21-	*****
lenderson's Transvaal.	7/3		President Brand	60/-	_6d	Pots Platinum	9/41	+1+d	SILVER, LEAD, ZINC		
ohnnies	43/3	+1/3	President Steyn	30/6		Watervaal	15/-		Broken Hill South	48/6	+1
and Mines	316	1 .10	St. Helena	24/9	3d				Burma Mines	2/74	+3
and Selection	35/-	714	Virginia Ord	13/14		COPPER			Consol. Zinc	35/6	+3
trathmore Consol	27/6	-124	Welkom	18/-	-1½d	Chartered	75/6	+3/-	Lake George	8/6	+1
Tallinore Consol	26/-	******	Western Holdings		*****	Esperanza	6/44		Mount Isa	44/6XD	+3
Inion Corp. (2/6 units)		-00	western Holdings	378		Indian Copper	4/9	+1+d	New Broken Hill	27/3	
ereeniging Estates	4 1	32				Messina	4 7	1 11	North Broken Hill	61/104	+5
rits	35/-	+74d				Nchanga	8 45	13			+2/10
est Wits	39/9	3d	WEST AFRICAN GOLD		1	Rhod. Anglo-American		+5/3	Rhodesian Broken Hill		
			Amalgamated Banket	1/6			14/6				+1,
AND GOLD			Ariston	5/9	1.34	Rhod. Katanga		+1/3	Uruwira	4/3	+74
lyvoors	33/6		Ashanti	19/3	114	Rhodesian Selection	17/3	+6d			
rakpan	7/6	+3d	Bibiani	4/14	-130	Rhokana	233	+11d			
ity Deep	16/-	1	Divimili	1/9	+120	Rio Tinto	241	+14d			
onsol. Main Reef	20/-	+71d	Bremang		******	Roan Antelope	17/71	+101d	Amal. Collieries of S.A.		
rown	40/-	1173	G.C. Main Reef	3/41	+110	Selection Trust	37/6	+2/-	Associated Manganese .	50/-	+1
aggas	3 17	1 112	W. Selection & Dev	6/3		Tanks	88/11	-1/101	Cape Asbestos	25/-XD	+2
	23/9	+3d	Konongo	2/3	-11d	TanksTharsis Sulphur Br	46/3		C.P. Manganese		+1
Doornfontein		730	Lyndhurst Deep	9d					Consol. Murchison	41/3	-2
Ourban Deep	28/9	+/40	Marlu	1/-	*****	TIN (Eastern)			Mashaba	41 .	
. Daggas	11/9	+30	Taquah & Abosso	2/-		Aver Hitam	26/-XD	+3d	Natal Navigation	3 3	
. Geduld (4/- units)	27/-					Gopeng	8/3xD	6d			****
. Rand Props	24	+16				Hongkong	7/3	+71d		81/9	+4
eduld	3 16		AUSTRALIAN GOLD		1	Ipoh	15/6		Wankie	14/-	1 7 4
ovt. Areas	11/9	+6d	D 1.1 D				8/-	+1/14	Witbank Colliery	345	+7
rootvlei	19/3	+3d	Boulder Perseverance	4/-	+1/11	Kepong Dredging	4/14	+1+0		318	
ibanon	10/6	—3d	Gold Mines of Kalgoorlie	13/6	*****		10/3xD		CANADIAN MINES		
uipaards Vlei	20/-	+3d	Great Boulder Prop	8/6	+11d	Malayan Dradging	26/6xD	+3d		\$294	1 -
farievale	18/3		Lake View and Star	14/3	+3d	Malayan Dredging	11/6	+1/-			+
fodderfontein East	17/6	+2/6	Mount Morgan		3d	Pahang	- 8/9		Hudson Pau Mining	\$28	
ew Kleinfontein	14/-			8/-	+74d	Pengkalen		+6d		\$82	1
ew Pioneer	12/44	1 41.4	Sons of Gwalia	4/3	-11d	Petaling	7/3	11d		\$753	+
andfontein	63/3				1 2	Rambutan	15/9	+9d			1
obinson Deep	17/9	1 1014	Western Mining	11/104	+1+d	Siamese Tin	7/-XD		Noranda	\$128	+
	13/9			0.01.007	1.120	Southern Kinta	16/6	+6d		£7	1 4
ose Deep	4/-				1	S. Malayan	23/9xD		Yukon	3/9	
mmer & Jack		*****	MISSELL AMERICA COLD			S. Tronoh	9/-	+3d			1
A. Lands	21/101	+1/3	MISCELLANEOUS GOLD			Sungei Kinta	10/9	-14d	OIL		
prings	3/3	*****	Cam and Motor		-4+d	Tekka Taiping	5/9		Anglo-Iranian	£1245	+
tilfontein	28/9	+6d	Champion Reef	5/-		Tronoh	22/3xD	+3d	Apex	55/74xD	+7
ub Nigel	42/6	+2/6	Falcon Mines	7/4%	11d	Honon		1 34	Attock	44/41	+1
an Dyk	3/9	-11d	Globe & Phoenix	26/6	1216	TIN (Nigerian and			Burmah		+3/
enterspost	12/-		G.F. Rhodesian	4/9					Canadian Eagle	33/9	+3
lakfontein	14/3	+3d	London & Rhodesian	4/41			14/41	+114	Mexican Eagle	17/9	1
ogelstruisbult	35/-	+1/-	Motapa	1/3				1/2	Shell (bearer)	61	
est Driefontein	54		Mysore			Beralt Tin	6/14	11/3	Shell (bearer)	61	+
Dand Consolidated	61/2	- 32	Numdudenna	5/3		Bisichi			Trinidad Leasehold	24/41	+
W. Rand Consolidated	51/3	*****	Nundydroog	6/41	+ 1-1d	British Tin Inv	14/9	******		25/9	+:
Western Reefs	48/-	+00	Oeregum	3/9		Ex-Lands Nigeria	3/44	-13d	Ultramar	31/9	-1

COMPANY NEWS AND VIEWS

Value of Selection Trust's Investments Disclosed

Selection Trust's consolidated revenue for the year to March 31, 1954, was lower at £1,577,041 compared with the figure of £1,966,640 in the previous year. This was due to reduced dividends being received from holdings in the Trust's diamond and S.W. African base metal interests together with lower double taxation relief on the dividends received from its American shareholdings and reduced share dealing profits. The latter having fallen to £42,491 as against the previous year's figure of £208.181.

The distribution, however, was maintained at the previous level of 42½ per cent on the company's issued capital of £2,242,399 in stock units of 10s. each. Details of the year's financial results were given in a preliminary profits statement (see M.J. June 11, page 710).

This year it is of particular interest that for the first time the groups balance sheet shows quoted investments at market valuation in addition to book value. The figure given for quoted investments as at March 31, 1954, is, in fact, nearly £10,500,000 which exceeds book value by the large amount of £7,563,569. Although it was, of course, generally assumed that a large margin existed over book value, perhaps an amount as great as this was a somewhat unexpected surprise. Moreover, the figure given conveys an idea of the extent of the group's large and widespread interests which can be roughly divided into base metal mining, diamond mining and gold mining. The major part of this investment portfolio is, however, held by the company's wholly-owned subsidiary, Seltrust Investments.

Foremost amongst Selection Trust's investments, certainly from the point of view of capital value, and also most likely as a revenue producer in its 20 per cent interest in the American Metal Company. This organization carries on a base metal mining, smelting and marketing business in addition to holding interests in many important mining undertakings, notably in the Copperbelt.

In fact, it was mainly due to its copper investments that the American Metal Company was able to offset a fall in operating income incurred during a year of falling lead and zinc prices. Only a slight decline in gross revenue, therefore, took place and the total of \$14,555,435 compares favourably with \$14,848,674 previously. Dividends totalling \$1.50 per share, plus a stock dividend of 5 per cent, were again distributed.

Of major importance to The American Metal Company are its holdings in Roan Antelope and Mufulira Copper Mining Companies and it is, incidentally, through American Metal that Selection Trust maintains its interest in these two prosperous undertakings. This interest, which is thus indirect, amounts to about 6½ per cent in each case. During their financial years to June 30, 1953, Roan and Mufulira made net profits, after providing for replacements and taxation, of £4,787,574 and £3,625,276 respectively, while dividends from the former amounted to 2s. 7½d. per 5s. stock unit, less tax, and those from the latter totalled 8s. 3d. per £1 share also less tax. The present confident tone of the copper market gives promise that the great prosperity of these two companies will continue.

Diamonds are the group's most important interest, which is represented by a stake of over 30 per cent in Consolidated African Selection Trust. This company is by far the largest single producer of diamonds—both gem and industrial—in British West Africa and during its financial year which ended June 30, 1953, it made profits, before tax, of £2,463,872 which was a substantial rise from the previous year's figure of £2,192,797. Dividends paid, however, were dropped from a previous level of 4s. per share to 3s. 9d. due to the large sum appropriated to reserve. The overall world position of the gem-diamond market remains satisfactory although there continues to be some falling off in sales of industrial stones. Indications are, however, that revenue in the current year ending June 30 will not show any substantial decrease over last year.

Another of the company's major interests is the Tsumeb Corporation, a copper, lead and zinc producer in S.W. Africa, in which the Trust has a 20 per cent direct and indirect interest. Unfortunately, however, a fall of lead and zinc prices during the financial year to June 30, 1953, reduced the net profits of this outstandingly rich and successful undertaking from £4,645,443 to £3,186,552. Consequently, the distribution had to be cut from a previous level of 14s. to 12s. 6d. The American Metal Company has an interest of over 28 per cent in the Tsumeb Corporation.

The Trust also has substantial interests in the South African gold mining industry amongst which the St. Helena and Western Holdings' properties figure prominently. Moreover, during the year investments in this sphere were extended by the acquisition of a substantial holding in Vaal Reefs Exploration and Mining Company, a developing property on the Far West Rand. Amongst other important holdings is the Yugoslav lead-zinc producing Trepca Mines, now nationalized, which is in the process of receiving large sums of money on account of the £5,200,000 provisional compensation claim against the Yugoslav Compensation Fund. This company has the right to a 20 per cent participation on ground floor terms in all new mining business undertaken by Selection Trust under the agreement reached in recent years whereby Selection Trust is entitled to 10 per cent of Trepca's net annual profits and also has the right to subscribe for 1,000,000 Trepca shares at par and a further 1,000,000 shares at 6s.

In the sphere of exploration the company has shown considerable activity and while its Canadian subsidiary, Selco Exploration Co., is at present actively investigating mineral properties in Canada, Bikita Minerals, an associated company, which was established last year, has exercised its rights over options on its lithium-beryllium property in Southern Rhodesia. The financing of this property, which has great promise, is being undertaken by Selection Trust, American Metal, Trepca Mines and the American Potash and Chemical Corporation.

In his statement to shareholders, Mr. A. Chester Beatty, Jnr., the chairman, referring to the group's high degree of liquidity says that he does not regard this as excessive when considered against the current costs of exploration and development of a new mine. It might well be added that the group is in what, for these days, is the somewhat exceptional position of being able to by virtue of its strong liquid position to follow through any promising exploration discoveries without recourse to outside finance.

At a current price of around 36s. 6d. xd. a yield of nearly 11½ per cent can be obtained on the Trust's ordinary shares. This return would not appear to be too high in view of the company's predominant interests in base metals and West African diamonds. The outlook, however, in view of the present better tone of metal prices, particularly the well sustained demand for copper, indicates a level of dividend income for the current financial year of not less than that for the year to March 31, 1954. Meeting, July 15, London.

Middle Wits' Satisfactory Investment Position

Due to the publication for the first time of consolidated profit and loss balance sheet figures by Middle Witwatersrand (Western Areas) there is no direct comparison between the financial results of the year to December 31, 1953 and those of the previous period. Nevertheless, it is possible to see that there has been a considerable increase in profits from investments realized and the latest figure of £57,531 is almost double that of £23,141 in the preceding period. Dividend income also rose from £1,750 to £29,023 although this was due to the acquisition of holdings in Anglo-Transvaal Consolidated Investment Co., Anglo-Transvaal Industries and other dividend paying companies from the American Anglo-Transvaal Investment Corporation with which latter company Middle Wits merged last year. However, as the company investment portfolio is comprised mainly of long-term gold mining investments whose dividend paying stage has not yet been reached, the future prospects are largely dependent upon progress made in the O.F.S. and Far Western Rand goldfields in which these interests lie. Indeed, it is unlikely that Middle Wits will be able to re-enter the dividend list until its investments in these areas mature.

Despite an increase in revenue the company's operations during the year to December 31, resulted in a loss of £4,340. This, however, comes as no surprise being mainly due to heavy exploration expenditure, together with financial commitments in respect of participation rights, mineral options, etc.

The company's investment position, however, is satisfactory and this is amply reflected in a market valuation of quoted investments as at December 31, 1953, of £2.574,645 (£1,340,232) which exceeds a book value of £1,539,278 by over £1,000,000. In addition, unquoted investments are shown at £520,732 of which £467.056 represents holdings in Hartbeestfontein and Buffelsfontein Gold Mining Companies. A recent capital increase by the latter mine, however, has subsequently added to the company's holdings in this investment.

Principal quoted investments held by Middle Wits as at December 31, 1953, consisted of holdings in: Anglo-Transval Consolidated Investment Co., Anglo-Transval Industries, Central Mining Free State Areas, Merriespruit (O.F.S.) Gold Mining Co., Rooderand Main Reef Mines, Stilfontein and Virginia (O.F.S.) Gold Mining Co. Amongst its other investments the company has approximately 67 per cent of New Klerksdorp Gold Estates.

Considerable diamond drilling investigation is also being carried out in areas over which mineral and surface rights are held in the O.F.S. and Western Transvaal. During the year ended December 31 a total of 13,270 ft. was drilled in three boreholes, all of which were completed. In addition, the company participated in the drilling of other boreholes in the O.F.S.

Of particular interest during the past year were investigations carried out on a portion of the farm Klerksdorp, Townland No. 44, and in the Saaiplaas area, where a drilling programme is being carried out by New Consolidated Free State Exploration Company. The work being carried out in the latter area is for the purpose of demarcating a mining lease in which Middle Wits will obtain a substantial participation. In both these operations encouraging results have been obtained. Furthermore, the company, together with New Consolidated Eastern Areas Pty., has recently acquired options over an area of approximately 135,708 morgen in the Ermelo, Standerton and Bethal districts of the Eastern Transvaal where a drilling programme on joint account with New Consolidated Eastern Areas is proceeding. Meeting June 29, Johannesburg. Mr. S. G. Menell is chairman.

H.E. Prop Again Pays 30 per cent

Another satisfactory year is reported by the H.E. Proprietary, and as the table below shows, no great change in group earnings has taken place.

Year to	Group	Taxa-	Net	Dividends	Carry
Dec. 31	Profit*	tion	Profit		Forward
	£	£	£	£	£
1953	231,191	120,779	86,828	49,500	134,753
1952	236,236	128,961	86,868	49,125	116,986

* Before depreciation and Directors' remuneration of £23,584 (1952-£20,407).

Dividends amounting to 3s. per share, or 30 per cent, were paid for the eighth successive year on an issued capital of £300,000 in 10s. It is, however, intended to bring the company's issued capital more into line with its assets by capitalizing an amount of £300,000 from general reserve and subsequently offering one new share for each share at present held. After this operation the company will take the opportunity of broadening the market in its shares by a sub-division of its 10s. shares into two new shares of 5s. each.

The company's interests are spread over several countries of the world including South Africa, Canada and Australia, and although its investments are predominantly concerned with gold mining properties, industrial interests have been acquired which in recent years have been progressively assuming greater importance. Quoted securities shown on the consolidated balance sheet at £708,482 were valued at £1,078,623 at December 31, 1953. In addition to this amount, however, government securities were held which had a market value of £32,118 and unquoted securities shown at a figure of £86,978. Additionally, current liabilities were exceeded by current assets by over£350,000.

In South Africa among its many and varied interests the company has a valuable stake in New Consolidated Free State Exploration Co., Luipaards Vlei Estate and Gold Mining Co. and Harmony Gold Mining Co. In Canada, its principal ininterest in the Kerr-Addison Gold Mine—a leading Canadian gold producer; while in Australia an investment is held in two producing gold mines; The Golden Horse Shoe (New) and through Gold Fields Australian Development Co., in Mount Ida Gold Mining Co.

In the United Kingdom the most important industrial assets are Moussec Ltd., the well-known wine producing company, and Metalion Ltd., a company engaged in the electro-plating business.

At a price in the region of 39s. 6d. xd. the 10s. ordinary shares of this company yield over 7½ per cent. Meeting, London, July 1. Mr. R. Ellerton Binns is chairman and managing director.

Société Minière du Bécéka Has Better Year

Net profits of the Société Minière du Bécéka for the year to December 31, 1953, after providing for all charges including taxation and provision for replacements and stock adjustments, totalled Frs.232,352,851 compared with Frs.183,746,691 in the preceding year. The directors recommend dividend payments

amounting to Frs.1,380 per share compared with Frs.1,160 last year.

In their report accompanying the accounts (extracts from which appear on another page) the directors point out that in addition to placing Frs.20,000,000 to capital depreciation account (the same as in the previous year) they have also placed Frs.80,000,000 to an ore reserve adjustment account (compared with Frs.90,000,000 last year). They consider this advisable because part of their diamond output is still being obtained from gravel deposits of higher than average grade. In order to mine closer to the average grade in future years without any reduction in output, considerable further expenditure on mining and ore handling equipment will be required. Incidentally, maintenance of output is now a matter of prime importance owing to the fact that sales in 1953 necessitated a further inroad into stocks which are now down to a minimum working level.

In addition, the report also emphasizes that Bécéka's revenue from its associated companies was exceptionally high in 1953 and warns shareholders that revenue from these sources is liable to considerable fluctuation, as for instance in the case of payments from Industrial Distributors (1946) Ltd., which are expected to be substantially down in the accounts for the current year.

Hendersons Transvaal Maintains Dividend

Preliminary figures announced by Hendersons Transvaal Estates for the year ended March 31, 1954, show that group profits, after all charges including taxation, have fallen from £94,224 to £88,933. A first and final dividend of 15 per cent on the company's issued capital of £563,697 8s. in ordinary stock units of 4s. has, however, again been recommended.

Year to Mar. 31	Taxa- tion	Group Net Profit*	Divi- dend	To Reserves	Minority Interests
	£	£	£	£	£
1954	84,759	88,933	46,486	37,403	12,882
1953	103,706	94,224	46,486	37.351	12,825

 Amount attributable to members of holding company before deduction of minority interests.

Meeting, London, August 4. Sir J. Ball is chairman and managing director.

West African Gold Returns

The following are the results of the West African gold producers for May. Aside from Bremang, Marlu and Taquah and Abosso, all the mines are showing higher gold outputs in the current financial year, although in some cases this has resulted in working a higher average grade of ore.

	May, 1954			hs since	Current Financial Year Total to date			Last Financial Year Total to date		
Company	Tons (000)		Profit (£000)	M'ti	Tons (000)	Yield (oz.)	Profit (£000)			Profit (£000)
Amal. Banket. Ariston Gold. Ashanti. Bibiani (1927) Bremang* G.C.M. Reef Konongo. Lyndhurst Deep Marlu Gold. T. & Abosso.	25 30 632 9 3 1 39	2,349 3,867	49·3 70·3 11·7 L2·8 11·4 14·3 5·4 11·7	8 8 8 8 8 5 11 8 8 8 2	549 258 196 213 1,989 92·6 22 8 311 54	126,234 50,305 7,624	381 · 3 515 · 3 67 · 5 L 28 · 7 130 · 2 101 · 0 44 · 8	230 182 242 3,056 95 19 8 334	79,408 119,500 49,226 15,139 36,699 17,900 8,484 32,617	376·9 610·0 97·6 L76·4 115·3 82·0 42·2

^{*} Cu. yds. dredged Profit figures include premium revenue

L denotes loss

Rooiberg Minerals Drops Dividend

Results at the mine during the "past few months" have been below expectations and this is no doubt primarily responsible for the decision of the Rooiberg Minerals Development Company to drop their distribution from a total of 75 per cent last year to 50 per cent for the year ended June 30, 1954.

This was disclosed in an announcement by the company who have recommended a final dividend of 12½ per cent on the one class issued ordinary capital of £200,000 in £1 shares which compares with the previous final of 37½ per cent. Power difficulties, the announcement continues, have affected the tonnage treated, added to which the grade of ore milled has fallen. In fact, the latest cumulative position up to the end of May, 1954, shows that profits have fallen to £215,007 compared with £314,075 for the corresponding period of last financial year.

Moreover, capital expenditure during the current financial year has been extremely heavy and provision has still to be made for further houses and for the Electricity Supply Commission power supply which, incidentally, it is hoped will be available within the next year.

Tekka-Taiping's Recovery

Due to the skilful and systematic manoeuvring of the Tekka-Taiping Co.'s dredge during the last month or so of the year to October 31, 1953, it was found possible to work ground of a good value which was previously inaccessible owing to a substantial covering of old tailings. However, this could have had little effect on the year's operations and it is therefore of particular credit to the company that it has been possible to step up operations to a level at which the fall in recovery could be offset. In fact, tin-ore recovered during the year was considerably increased over last year's figure as the year was considerably increased over last year's figure as may be seen from the table below.

Year to Oct. 31	Ground (cu. yds.) Treated	Tin ore Recovered (tons)		per	Price for tin ore	Tin ore Sold (tons)	
1953	(000)	194	.21	10.1d	£ 443	249	
1952	1 473	169	.25	18.2d	564	210	

Total revenue for the year, despite the drop in the price of tin, showed no great difference from that of the preceding period. This, besides being the outcome of increased production, was also due to sales of tin-ore from stock.

	Mining Revenue†	Other Income	Net Profit;	Divi- dends	To Reserve	Carry Forward
1953	131,812	7,294	5,054	5,500	NIL	34,566
1952	141.519	9,426	9,625	10,750	9,116	35,012

† Including sales from stocks of tin ore. ‡ After £10,000 written off Capital Expenditure (1951-52 £4,083) and tax of £16,471 (1951-52 £10,172)

A dividend of $2\frac{1}{2}$ per cent has been paid on the company's issued capital of 399,980 £1 shares compared with 5 per cent in the previous year.

During the first five months of the current financial year the output of tin-ore was 235 tons as compared with 894 tons produced in the previous corresponding period, in addition to which improvement there has also been a considerable improvement in the tin price. On the other hand, it was disclosed by the company last April that the dredge would shortly pass into ground which, according to the bores, is of a lower grade. It is not to be expected, therefore, that this level of output will be maintained. Nevertheless, at the current price of around 5s. 9d. the comparatively low return of about 8½ per cent would seem to indicate a good deal of confidence in the company's future prospects.

Meeting, Redruth, June 28. Mr. Donald W. Thomas is chair-

Ampat Tin Increases Dividend

During the year to December 31, 1953, the output of tin concentrate by Ampat Tin Dredging rose to a figure of 1,266 tons against 897 tons during the preceding period. This sharp increase in production enabled the company to show a small gain in revenue above last year's level in spite of a fall in the price of tin which brought the average price realized down by some f250 per top correctly with the receivement of the processory with the receivement of the processory with the proces £250 per ton compared with the previous period.

Year to	Gross		Net	Contin-	Dividend	Carry
Dec. 31	Revenue	Costs	Profit	gencies		Forward
	£	£	£	Reserve	£	£
				£		
1953	679,852	517,110*	82,742	18,947	48,125	86,476
1952	674,296	352,988	148,308	36,376	40,312	70,806
* Includi	ng provision	n for repair a	nd renewal	of spare part	s £81,456.	

As will be seen from the above table net profits for the year have considerably decreased but, despite this, the recommenda-tion of a final dividend of 20 per cent (15 per cent) on the issued ordinary capital of £250,000, increases total distribution for the year by 5 per cent over last year.

All of the increased output during the year came from the new Kent section dredge which was responsible for producing 532 tons of tin concentrate since it commenced operations on February 1, 1953. In the other two sections, Batu Caves and Bidor, the dredges also worked satisfactorily throughout the year, producing 344 tons and 390 tons respectively. During the first five months of the current financial year, however, a total of 460½ tons have so far been produced which makes a decrease from the level of 489 tons for the corresponding period last year.

In common with many other eastern tin companies a high yield is obtainable on the ordinary shares and this at present is nearly 19 per cent at a price of around 7s. Meeting London, June 29, Mr. J. Ivan Spens is chairman.

Hongkong Tin To Resume Operations In September

During the year to September 30, 1953, the Hongkong Tin Co. both dredged more ground and recovered more tin-ore than in the previous year. Moreover, there was an improvement in the grade recovered and a decline in costs.

	Ground Treated			Working Costs	Price Recd	. Cost per
	(000 cu yds)			(cu. yds.)	ore*	ton ore
1953	1,899	312	.37	12.1d	422	350
1952	1,784	239	.31	15.3d	514	477
4 T to	Harris					

Despite a considerable drop in the price received for tin-ore the sale of the substantially greater tonnage produced brought in more revenue than in the previous year.

Year to Sep. 30	Total Revenue £	Expenses etc.*	Operating Profit	Taxa- tion	Net Profit £	Carry Forward
1953	140,225	106,457	33,768	20,589	13,179	58,257
1952	129,273	123,787	5,486	12,265	L 6,779	45,078
* Of this	£94 117 (19 ⁴	51-52 £115.26	(2) represente	dexpenditu	ure in Mala	va.

No dividend was declared on the company's issued capital of £150,000 in stock units of 5s.

Over three years ago the company decided on a conversion project under which the dredge was to be fully re-equipped. Owing, however, to delays in supplies of materials this programme could not be started until last March. Mr. J. Addinsell, the chairman, now discloses, however, that this work will be completed by September when dredging operations will be resumed.

Accordingly, the production of 149½ tons of tin-ore which resulted from the first five months' operations of the current financial year must be regarded as being the total year's output.

Meeting, June 25, London,

Killinghall Tin Makes Loss But Pays 10 per cent

As foreshadowed last year by Mr. Jack Addinsell, the chairman, operations during the latter half of Killinghall Tin's financial year to September 30, 1953, produced only a small amount of tin ore. This was due to an alteration in course by the company's dredge which during that period was working in low grade ground

	to Ground 30 Treated					
Sep. 2	(000cu.yds)				per ton tin-ore*	cost
					£	£
1953	2,133	285.8	.31	14d.	469	435
1952	2,023	621.1	.69	15.7d	528	214
* Less	tribute.					

It is not surprising that revenue from the sale of this considerably lower tonnage of tin-ore, produced during a period of falling tin prices, together with production costs more than doubled on last year's figure, was not sufficient to cover operating expenses and taxation, and that the company's operations resulted in a loss for the year.

Year to	Total	Taxa-	Net	Divi-	To	Carry
Sep. 30	Revenue*	tion	Profit	dend	Reserve	Forward
-	£	£	£	£	£	£
1953	139,860	8,700‡	L 8,633	8,250	NIL	21,649
1952	330,330	66,600	111,630	20,062	25,000	20,666
* Before	expenses, der £18,000 reco	reciation, et	c. of £139,92 pect of E.P.	L = 1	£152,100).	

It is emphasized by Mr. Addinsell, in his statement to share-holders, that in view of the company's low earnings no dividend would normally be justified. However, an amount of £18,000 recovered in respect of E.P.L. has made possible the payment of 10 per cent on the company's issued capital of £150,000 in 5s. stock units. This compares with a total of 25 per cent for the previous year.

Since the first month of the current financial year when the dredge was turned south bringing an immediate improvement in value and conditions, there has been a sustained improvement in operations, and although the ground ahead is variable, seven months' production so far has yielded 354½ tons of tin-ore which is in advance of last year's figure for the corresponding period.

At the present price of around 6s, xd, the 5s, ordinary shares of this company yield 8½ per cent, a low return for an investment of this type which no doubt discounts a brighter future.

Meeting, June 25, London.

Kinta And Tanjong Pay Lower Dividend

During the year ended December 31, 1953, the total revenue earned by Kinta Tin Mines fell to a figure of £160,910 as compared with £211,955 in the preceding year. Dividends paid on the issued capital of £120,000 in shares of 5s. amounted to 32½ per cent, or 1s. 7½d. per share, as compared with 40 per cent, or 2s. per share, in respect of the previous year.

Operations during the year to December 31, 1953, carried out by Tanjong Tin Dredging resulted in a substantially decreased total revenue at £336,008 compared with £591,196 in respect of the previous period. Accordingly, the company reduced its distribution to 47½ per cent, or 2s. 4½d. per share, on its issued capital of £185,834 in units of 5s. from a level of 80 per cent, or 4s. per share, in the preceding year.

The operations of these two companies will be reviewed more fully next week.

Nigerian Consolidated Re-enters Dividend List

Dividends and interest received by Nigerian Consolidated Mines during the year ended March 31, 1954, showed a decrease to £6,043 against the previous year's figure of £8,042. Despite this, however, the company has returned to the dividend paying list with a 5 per cent distribution on its issued ordinary capital of £70,000 in 2s. units. It is also disclosed from the report and accounts that the company intends to offer subscription at par 350,000 shares of 2s. each on the basis of one new share for every two shares held. Meeting, July 16.

Natal Navigation Collieries Again Pay 25 per cent

A preliminary estimate of the group profit earned by the Natal Navigation Collieries Estate Co. in respect of the year ending June 30, 1954, after all charges and taxation, reveals a slight rise from last year's figure of £225,600 to £230,000. There was again no liability for taxation and profits attributable to members of the holding company were £229,500 compared with £225,100 for the previous year.

Accordingly, a final dividend of 10 per cent plus a bonus of 5 per cent has been declared on the company's issued capital of £671,349 in £1 shares, this, together with the interim dividend of 10 per cent brings the total year's distribution to last year's level of 25 per cent, or 4s. per £1 share. The gross figure absorbed by these dividends was £167,837 for both years.

Transvaal Navigation Collieries Maintain Dividend

It is announced by the Transvaal Navigation Collieries and Estate Company that a final dividend of 5 per cent has been declared on the £500,000 issued capital of the company. This is equivalent to 3d. per 5s. share and, together with the interim of the same amount, makes a dividend of 10 per cent in respect of the year ending June 30, 1954, which is thereby unchanged from last year. Estimated profits for the year were £116,000, an increase of £17,600 over the previous year's figure of £98,400.

Apex To Pay Increased Final on Doubled Capital

In addition to maintaining its interim dividend in respect of the year ending September 30, 1954, of 6d. per stock unit, tax free, on the present issued capital of £550,000, Apex (Trinidad) Oilfields also announced a scheme to increase the company's issued capital to £1,100,000. This will involve, subject to the consent of the Capital Issues Committee, the issue of one 5s. unit of stock, credited as fully paid, for each 5s. unit at present held. Furthermore, having regard to the financial results of the company for the current year to date, it is the company's present intention to recommend in December next a final dividend of 1s. 3d., tax free, per 5s. stock unit. This dividend is to be paid on the increased capital of £1,100,000, thus marking an increase of 3d. per stock unit over the equivalent final dividend of 1s. per share for the year 1952-53. Notice of an extraordinary meeting of the company, at which this proposal will be considered, will be issued within the course of the next few weeks.

MINERALOGIST/ASSAYER required by mining company in Northern Nigeria. Qualifications: University graduate with at least 2nd Class Honours B.Sc. in Mineralogy or Geology (and in latter case special experience or aptitude for Mineralogy). Free passages, 18 months' tours. Applications, giving full particular of qualifications and experience and salary asked, to Box 19, Walter Skinner Ltd., 20 Copthall Avenue, London, E.C.2.

ST. JOHN D'EL REY MINING

The Ordinary General Meeting of the St. John d'el Rey Mining Co. Ltd. was held at Winchester House, Old Broad Street, E.C.2, on Tuesday last.

The Right Hon. Lord Rathcavan, P.C. (Chairman), who presided, in the course of his speech said:

The results for 1953 are the worst we have had for many years. It has been a most difficult and unsatisfactory year and our troubles have been due in the main to economic and labour factors over which the Board has little or no control.

The net loss, including a loss on exchange on cruzeiro assets in Brazil of over £300,000 and after charging the cost of Development and Depreciation, both lower than last year, together with Taxation and London Expenses, amounts to £347,297. After crediting United Kingdom Income Tax no longer required and Transfers from contingencies and General Reserves of £345,432, and writing off £62,335 from Investments, due to loss on exchange, there is a sum of £54,040 to be dealt with.

The Board recommend a Dividend of $2\frac{1}{2}$ per cent net on the Ordinary Stock and have decided to carry forward £28,505 to next year's accounts. The Board felt justified in recommending this small Dividend as at the time they made it the results for the early months of 1954 were encouraging.

The tonnage treated during the year amounted to 311,300 tons of which 201,300 tons came from Morro Velho and 110,000 from Espirito Santo. The average grade was 11,10 grammes (7.14 dwt.) and the value of the bullion produced was £1,759,146. This compares with a tonnage of 381,100 and a grade of 10.96 grammes (7.05 dwt.) last year, when the bullion produced was £2,958,423. Development cost considerably less at £62,091, while the working cost, due to exchange, fell from 131s. 4\frac{1}{2}d, per ton to 107s. 1\frac{1}{2}d, and developments from 6s. 3d. to 3s. 11\frac{1}{2}d. I would point out that comparisons are really valueless owing to the vagaries of exchange.

The rate of production of ore per man per day shows a heavy decline, being 485 kilos compared with 497 in Morro Velho, and 722 against 815 in the Espirito Santo group. Labour during the year has been most difficult and it remains to be seen whether the rise in the minimum wage will effect any improvement.

The sale of 80 per cent of the Company's gold on the free market has been spasmodic, although at the end of the year stocks were not unduly high. The price at the beginning of the year was approximately Cr.\$47,00 per gramme and, following the wide fluctuations in the ree exchange rate, it has varied throughout the year, having been as high as Gr.\$69,00. At the end of the year it was approximately Cr.\$67,00 while the latest price is Cr.\$66,00.

Our cash resources in Brazil were very seriously strained as a result of the strike in May, to which I referred last year, and also to the second strike which occurred in November and which lasted much longer. However, the Bank of Brazil has been most helpful in coming to our assistance.

In May, 1934—twenty years ago—a decree was promulgated giving certain advantages to Gold Mines operating in Brazil. This has now lapsed, but I am glad to say that a request for the renewal of this decree for a further twenty years (except for the clause relating to the sale of gold) has been sent forward with his recommendation by the President of the Republic to the Chamber of Deputies and the Senate, so it is to be hoped that it will become law in the near future.

The ore reserves at the end of 1953 amounted to 6,691,000 tons. The average indicated value of these reserves is 12.5 grammes (8.0 dwt.).

Work on the Capital Development Programme continued throughout the year.

When a country is suffering from the vicious spiral of inflation, as Brazil certainly is, the consequent rise in the cost of living naturally leads to labour unrest. This has been the case in Brazil during the past year.

As regards the current year, while tonnage has been low, the grade of ore produced has been good and overall results have so far been quite satisfactory but the situation will be radically altered as soon as we begin to feel the full impact of the new minimum wage which comes into operation on July 4.

The Managing Director flew out to Brazil at the time of the strike in October and took part in the negotiations for a settlement. Immediately after the strike, I myself travelled out by air and was in Brazil for a fortnight when important discussions took place on matters concerning future policy. I went again to Brazil in January and was on the property, for a month.

The report and accounts were adopted,

SOCIÉTÉ MINIÈRE DU BÉCÉKA

(Incorporated in the Belgian Congo)

The Thirty-fourth Annual General Meeting of the Société Minière du Bécéka was held on June 15, 1954. The following are translated extracts from the Directors' Report which has been circulated to shareholders.

World production of rough diamonds, gem and industrial together, is estimated at 18,601,091 cts. for 1952, compared with the revised total of 16,947,186 cts. in 1951. The exact figure is not yet known for 1953, but it is expected to show an advance on previous years.

The Central Selling Organization, which deals with the distribution of rough diamonds, and particularly with the South African output, gives the value for world sales in 1953 as £61,155,941 compared with £69,661,926 in 1952. The total of gemstone sales has surpassed previous records, but may be affected in future years, because stocks accumulated before and during the war are now becoming exhausted. The industrial diamond market has felt the effect of the recession in some sections of the industry, particularly in the United States, which is the principal buyer. This market has also been affected by the increase in Gold Coast production, consisting almost wholly of industrial diamonds, which tend to reach the market very haphazardly. The demand for diamond drilling purposes has been maintained at a satisfactory level.

With regard to crushing boart with which your company is principally concerned, a better balance between supply and demand has resulted from the growing demands of various public utility projects which have been initiated. The recent contraction in demand has had the effect of bringing back to somewhere near normal the price level at which sales have been affected outside the Selling Organization. Prior to this, prices of such sales had at times been more than double those of the Selling Organization, and were in danger of encouraging the development of substitutes.

The efforts your company have made in recent years to supply the needs of the diamond tool industry are bearing fruit, and our production for 1953 totalled 12,056,000 cts. compared with 5,273,000 cts. in 1948.

Throughout these years we have had as our objective the maintenance of a supply of boart at a moderate and stable price, so that the large industrial consumers may be protected against the unreasonably high prices mentioned above, and assured of a regular supply on which they can develop industrial techniques using our materials.

THE COMPANY'S ACTIVITIES IN 1953

The extent of the deposits held under licence remained unchanged during the year. The number of holdings which were actually worked for d'amonds or gold last year amounted to 35, covering an area of about 100,000 hectares. Modifications in the landholdings by the company during 1953 resulted in 4,419 hectares being used either for industrial or agricultural projects, either for our health and recreational services or for housing of native workers and European employees.

DIAMOND PRODUCTION

Lubilash Section. Production in 1953 rose to 12,016,199 cts compared with 11,013,854 cts. in 1952. Nine mines were in production, of which four were working three pits, two working two pits and three working one pit. This new high level of production which necessitated treating about 3,443,000 cu. m. of overburden and diamond-bearing gravel, was achieved first by opening up the Disele deposits, where a substantial area of overburden and gravel necessitated the use of heavy earthmoving equipment, as well as new washing and concentrating plants; and secondly by a general improvement in the mining machinery in use, which has become possible now that the Young hydro-electric station is working. Electrically driven equipment is now replacing diesel-powered plant, and additional heavy earth-moving equipment for the removal of overburden will come into service at the end of 1954.

The proportion of overburden stripped mechanically in 1953 was 90 per cent and of diamond-bearing gravel 70 per cent, against 82 per cent and 51 per cent respectively in 1952.

Luého Section. A new mine has been opened, bringing the number being actively worked up to three. Production in 1953 was 39,858 cts., compared with 11,576 cts. in 1952.

GOLD PRODUCTION

A slight fall in production was recorded at the Musefu mine, which yielded 44 kg. compared with 47 kg. in 1952. The crushing plant has been closed in the interests of economy. This mine, situated in an area from which most of the manpower employed by the Lubilash section is drawn, is mainly used as a recruiting and training centre.

PROSPECTING

No new diamondiferous deposits were discovered in the year under review. The major portion of those deposits already known have, on investigation, revealed an encouraging diamond content. New alluvial reserves have also been identified.

THE YOUNG CENTRAL HYDRO-ELECTRIC STATION

The last two groups of turbo-alternators were erected at the beginning of 1953. The electric power now made available provides scope for new plans both for our mining operations and also for the two European communities and for the native settlements. The power station was opened by your Chairman on August 2, and the opening was attended by the Governor of the Province, and many other notables.

ASSOCIATED COMPANIES

Société Bécéka—Manganese. Steady progress is being made with the erection of the company's plant and buildings. Work has been concentrated mainly on the electric generating plant, provision of mining equipment and the erection of houses for the European officials and natives. Work on the crushing, washing, and sorting plant and the workshops was also carried out. Prospecting continues and the results of the drilling programme undertaken have enabled the Kisenge deposits to be assessed. The transport situation has improved, so that by the end of 1953 the production figures for manganese were considerably higher than those for 1952, and deliveries kept pace with contract requirements.

The accounts for the year 1953 closed with a profit of Frs.C.16,189,163 which, after putting Frs.C.4,943,386 to statutory reserve, allowed of a dividend payment of Frs.C.100 on the 80,000 shares issued. The statutory royalties payable to the Colony rose to Frs.C.7,229,600. The accounts for 1953 are in course of preparation.

Société Diamant Boart. Sales for 1953 were about 10 per cent lower than those for the preceding year. This decline was principally due to the lowering of the boart prices, brought about by the keen competition experienced during the year. After allowing for amortization and other charges amounting to Frs.4,175,092, the accounts for the year 1953 for the Société Diamant Boart reveal a profit of Frs.1,731,926 to which should be added the sum of Frs.288,108 carried over from the previous year. This profit enabled the dividend to be maintained at Frs.285 on each of 12,000 issued shares (representing a capital of Frs.35,000,000). The sum of Frs.6,000,000 was carried forward to special reserve accounts.

The company's French subsidiary has closed its second financial year with a profit. The continued growth of its business has necessitated an increase of its capital from French Frs.24,000,000 to Frs. 48,000,000.

The Société Diamant Boart has decided, in view of the growth of its commercial and industrial operations, to increase its capital from Frs.35,000,000 to Frs.50,000,000 by capitalizing the sum of Frs.5,000,000 transferred from its reserve account and by calling on shareholders for another Frs.10,000,000 shares, to which your company will contribute by virtue of its 80 per cent shareholding.

Industrial Distributors (1946) Ltd. The downward trend of industrial diamond sales noticed earlier in this report was reflected in this organization's accounts for 1953. Consequently, the distributed proceeds from sales will show a considerable reduction on those of 1952, which benefited from exceptionally favourable conditions, resulting in a substantial increase in revenue which is reflected in your company's profit and loss account accompanying this report.

Diamond Trading Co. and Diamond Purchasing and Trading Co. Distributions in respect of 1953 by these two companies, which are concerned with the marketing of uncut gem diamonds, were identical with those of the preceding year.

Société d'Elevage et de Culture au Congo Belge (S.E.C.). The accounts of this company for 1953 showed a profit of Frs.10,938,165 in 1952 which enabled a dividend of Frs.95 per share to be paid. The accounts for 1953 indicate that this dividend will be maintained.

Union Financière et Maritime "Ufimar." Profits for the year 1952-53 increased to Frs.67,268,336, excluding the carry-forward from the previous year of Frs.2,448,973. A net dividend of Frs.270 was paid and a sum of Frs.10,033,099 was put to reserve

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The Eighteenth Annual General Meeting was held on June 22 in London.

Major-General W. W. Richards, C.B., C.B.E., M.C., Chairman of the company, presided, and in the course of his speech said: To our regret it is taking far longer to secure maximum tonnages from the Fanti Mine than was anticipated and, even to-day, ten months after the Ropeway was brought into commission, Fanti has not yet attained full production.

The Tamsoo Mine has so far proved a more profitable investment. A steady output of 11,000 tons per month of good grade ore has been maintained from this Section for many months past.

The excellent production figures for the month of May this year will not have escaped your notice. Notwithstanding the absence of any premium in the free market price of gold, which you will have noted amounted during the year under review to no less than 14s. 6d. per oz., the net Mine profit last month amounted to the gratifying figure of £26,669; and this was achieved after charging Development Expenditure amounting to £7,561. These good figures were not, as may have been assumed due to a better return from the Fanti Mine, but were largely attributable to our older and tried Sections, Abbontiakoon, Mantraim and Pepe. The total tonnage mined and milled from all sections reached the record figure of 70,958 tons, and the overall grade showed a modest improvement.

For the past two years we have restricted development work to the essential minimum; thus husbanding the financial resources of the Company throughout the reconstruction period. With the virtual completion of all Capital works and heavy charges of that nature, we must now enlarge development operations to ensure the future maintenance of the ore reserves. The present rate of 700 feet of development per month will accordingly be increased to 900 feet per month for the remainder of this year, after which the rate will be progressively increased to reach 1,200 feet per month by September, 1955. This programme, subject of course to the degree of payability encountered, should safeguard the immediate and near future. The position will be under constant review in the light of results.

The report and accounts were adopted.



This is the office of the Commissioner and Trade Commissioner for the Gold Coast in the United Kingdom, where commercial and general information may be obtained.

The premises at Melbourne House, Aldwych, W.C.2, have been retained by the Gold Coast Government and this section is now responsible for Recruitment and Student Work.

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The 48th annual general meeting of South Crofty, Ltd., was held on June 16 in London.

Mr. J. P. A. Harvey, J.P. (Chairman of the Company), presided and in the course of his speech said: Unfortunately, the accounts showed a loss of £56,586, although tonnage crushed increased by 7,958 tons, due to the additional underground labour available, and costs per ton milled were down from £5 18s. 2d. in 1952 to £5 16s. 3d. in 1953. The prices for tin metal ranged in 1952 from £983 to £933, and in 1953 from £944 to £579, an average difference of £300 per ton. Despite increased production the sales of tin realized £245,878 against £303,641, due to the great fall in the price of tin.

It was hoped that the electric pumps would have been delivered much sooner. Robinson's engine, now 100 years old, had given considerable trouble, and stoppages had meant baling operations, thus interfering with the haulage of mine ore for the mill. Both machine men and machines had to be diverted from production for other work. The first pump was started at the 195 fathom level on May 24, and the usual teething troubles were experienced. The new pumps for the 340 fathom level had also reached the property. When the Cornish pumping engines at Robinson's and East Pool could be stopped a saving of £25,000 should be possible.

A new lode had recently been cut in the drive to North Roskear shaft. This discovery was in the Dolcoath section, the mineral rights of which were owned by the 'company'. Ore reserves were ample for some years ahead, even if the monthly rate of milling was stepped up considerably.

During the first five months of 1954, 25,234 tons of ore milled gave a recovery of 254,545 tons of tin concentrate and 4.1 tons of wolfram, an average recovery of 22.96 lb. of tin and wolfram. During the first three months tin metal averaged £715.

When the electric pumps were in full commission, and the mill treating 6,000 tons per month, the mine should break even with tin at £615 per ton, as stated in the report of Mr. T. Pryor. At the moment even with tin at £720 per ton the company was working at a loss, owing to the non-recurring expenditure in the erection of the new pumps. By late autumn they should benefit from these new pumps.

At Castle-an-Dinas output for 1953 was 29½ tons of wolfram, an increase of 3½ tons, but the amount realized was £8,000 less. The report and accounts were adopted.

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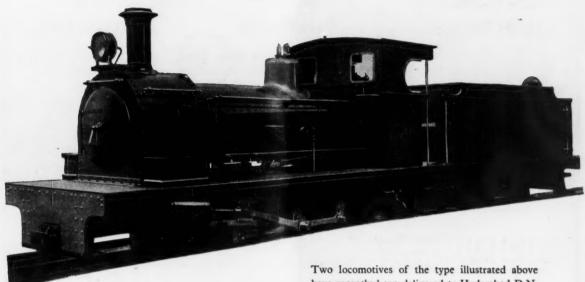
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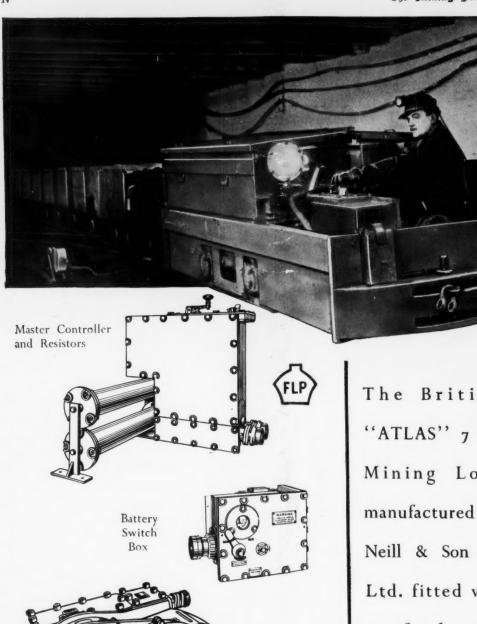
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